

## Volume No. 2 of 'The Refrigeration Library' Makes Its Appearance on the Desks of Sales Executives



REFRIGERATION AND AIR CONDITIONING MARKET DATA for 1935, a book of 304 pages, is now being studied by manufacturers, distributors, and dealers whose paid-in-advance orders were on file at the Detroit headquarters of Business News Publishing Co.

The new book is Vol. No. 2 of a

series known as "The Refrigeration Library." Other volumes, now being compiled, will be announced later.

The MARKET DATA BOOK is of particular interest to those concerned with the sale of refrigeration and air-conditioning equipment, whereas the DIRECTORY (Vol. 1 of the series) was designed mainly for buyers.

The new book contains all available statistical information on past sales with graphic white-on-black charts to show the progress of the industry at a glance. In addition, many pages are devoted to a descriptive account of the advertising and selling methods used by the successful leaders in the field.

### Bancredit Plan Cuts Financing Charges

(Concluded from Page 1, Column 5)

not be secured by mortgage or collateral.

"Notice of Loan Transmitted to Washington.—Notice of the making of a loan is transmitted by the lending institution to the FHA at Washington, D. C.

"Payment of Defaulted Obligations.—If the borrower remains in default for 60 days or more, the principal amount of the obligation plus accrued charges, upon demand by the lending institution is paid by the Administration."

The Bancredit finance plan can be used on sales to property owners, renters, lessees, and land contract purchasers. Sales to receivers, trustees, bondholders committees, etc. can not be financed.

In the May 15, 1935, issue of ELECTRIC REFRIGERATION NEWS, a report of terms of a financing plan established in San Diego in cooperation with the FHA included the following paragraphs:

"Dealers are to have rate charts and application forms on hand. The banks usually require 24 hours to check applications. If satisfactory the full purchase price of the refrigerator is available to the dealer in cash, with no liability whatever. Payments are made direct to the financial institution."

"In accordance with the Housing Act provisions, a permanent connection must be made by a licensed electrician. In most cases this is done with a BX cable installation."

In the March 6, 1935, issue of ELECTRIC REFRIGERATION NEWS, a similar plan established in Louisville, Ky., is outlined as follows:

"The purchaser selects the type of electric refrigerator he desires from any reputable dealer and signs the credit statement and a note required by the government. The note is then taken over by one of the financial institutions which pays the dealer in full. Payments may be extended over a 36 months period."

### 1,064 Ice Refrigerators Sold in Kentucky In 4½ Months

LOUISVILLE, Ky.—Eighteen Kentucky manufacturers of ice refrigerators sold 1,064 units from Jan. 1 to May 15 of this year, according to results of a survey made recently by R. T. King, secretary of the Kentucky Ice Association.

Majority of sales, the survey revealed, were between \$29 and \$75, but, taking an average for all refrigerators sold, shows the most popular models to be those selling in the neighborhood of \$50.

While no 1934 sales figures were available, the report estimated an increase of 200 per cent in sales.

Several selling plans are being offered by manufacturers, most outstanding of which is the 30 days free trial and sales at cost. Almost without exception, ice deliverymen and other ice company employees are the sole sales agents, with bonuses of from \$2.50 to \$5 for each unit they are instrumental in selling.

Some manufacturers, the survey showed, maintain special showrooms on principal city streets, but most are continuing to use their own plants for this purpose. A few have fitted out trucks with a display of several models, for use as sidewalk sales-getters and as general advertising on city streets.

Three-way food protection advertising is being played up extensively, with good results. Other advertising approaches include comparisons, movie slides, and spot radio announcements.

To boost sales, a number of dealers are giving free ice for 30 days with each sale, the survey indicated. Terms are liberal—a few dealers offering "no down payment, three years to pay," while others range from 25 cents a week to \$5 a month.

Refrigerator manufacturers, the survey revealed, have helped business by guaranteeing their product against ordinary wear and tear—one even went so far as to replace scratched tops and doors free of charge.

- Porcelain inside and outside.
- 3" of pure "Armstrong's" insulation, hydrolene sealed.
- Hard rubber sliding doors.
- Chrome hardware.
- 3 plate glasses set in hermetically sealed rubber frame—absolutely sweat proof.
- Backed by a reputation for high quality and reliability, built up during more than 35 years in the manufacture of refrigerators.

### Special Finance Plan Sells 2,500 Units

READING, Pa.—Approximately 2,500 electric refrigerators were sold here during a recent two months' campaign conducted by the Reading electrical association in cooperation with the local utility company. A special financing plan, backed by the utility, featured the campaign.

Opening the sales drive was featured by a mile-long parade of decorated trucks carrying refrigerators, and preceded by a band, through the city's main streets. After the parade, aerial bombs and fireworks were released. A 14-page section in the local newspaper was devoted to electric refrigeration promotion and news.

During the campaign, a financing plan developed by the Metropolitan Edison Co. was used. Under the plan, dealers could sell refrigeration units for a down payment of \$2, extend terms up to four years, and discount all their time paper with utility company, making every sale a cash transaction for the dealer.

In discounting the paper, the utility retained 3 per cent of the selling price, which was placed in a contingent fund to take care of possible losses on repossession.

The utility also assumed responsibility for making collections of monthly instalments. The monthly payments due from refrigeration customers were added to the monthly bills for meter service.

The following method of handling repossession was also adopted. A number of dealers were appointed as an appraising committee, and where it became necessary to make a repossession this committee appraised the refrigerator, and named the price at which the dealer who sold it should repurchase it. The difference between the selling price and the repossession price was a loss chargeable to the contingent account maintained for that purpose.

Practically the only credit requirement established by the utility company to make customer paper eligible for discount was the paying record with the utility.

Salesmen for the Metropolitan Edison Co. assisted the local dealers instead of competing with them. The utility company also opened its display room to the dealers, displaying refrigerators of all makes carried by them, and placing a man on the floor to demonstrate the various models to prospects.

Trade-ins of ice boxes were accepted regardless of condition. The electrical association established an allowance schedule which was adopted by all dealers. This provided for a \$5 allowance for an ice box when the customer purchased a lacquer-finished refrigerator, and \$10 allowance if a porcelain box was purchased.

## 14,951 Commercial Units SOLD by 18 Manufacturers in April, 1935

Commercial sales and inventories for May 1935, were reported to the National Electrical Manufacturers Association (Nema) by 18 companies, some of which are not members of the association. These reports cover the sale of units less than 1 hp. in size. Companies reporting are: Baker Ice Machine Co., Brunner Mfg. Co., Carbondale Machine Corp., Carrier Engineering Corp., Crosley Radio Corp., Frigidaire Corp., General Electric Co., Gibson Electric Refrigerator Corp., Keenator Corp., Leonard Refrigerator Co., Norge Corp., Phoenix Ice Machine Co., Reliance Refrigerating Machine Co., Servel, Inc., Uniflow Mfg. Co., Universal Cooler Corp., Westinghouse Electric & Mfg. Co., and York Ice Machinery Corp.

COMMERCIAL	Quantity	Domestic Value	Quantity	Canadian Value	Quantity	Other Foreign Value
1. Water Coolers Complete...	1,456	\$ 153,037	2	\$ 135	57	\$ 6,169
2. Water Coolers Remote...	54	3,235			3	195
3. Ice Cream Cabinets Complete	2,017	242,084	185	18,490	105	16,053
4. Ice Cream Cabinets Remote	652	92,334	10	1,480	54	7,121
5. Beverage Coolers Comp.	3,745	281,549	6	364	18	1,350
6. Beverage Coolers Remote	241	19,643			4	278
<b>Condensing Units</b>						
7. Less than ½ Hp.	792	49,357	4	229	477	29,586
8. ½ to 1 Hp. Inc.	3,593	268,259	143	12,448	1,277	109,117
9. Above 1 ½ and less than 1 Hp.	831	122,266	42	5,676	201	27,190
10. Total Lines 7, 8, and 9	5,216		189		1,955	
11. Total Lines 1, 3, 5, 10	12,434		382		2,135	
12. Evaporators	4,209	131,644	319	11,854	1,435	39,956
13. Miscellaneous Cases and Cabinets	23	6,197	21	1,350	4	1,084
14. Total Commercial		\$1,369,605		\$52,026		\$238,099

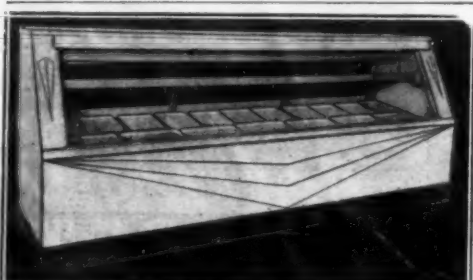
## 46,972 Commercial Units in STOCK April 30

COMMERCIAL	Quantity	WORLD SALES Value	Quantity	Factory, Branch & Warehouse Value	Quantity	Distributor Value
1. Water Coolers Complete...	1,515	\$ 159,341	10,621	\$1,052,902	3,028	\$290,388
2. Water Coolers Remote...	57	3,430	6,262	249,343	73	5,802
3. Ice Cream Cabinets Complete	2,307	276,627	3,063	446,385	116	16,579
4. Ice Cream Cabinets Remote	716	100,935	3,080	424,035	268	34,869
5. Beverage Coolers Comp.	3,769	283,263	1,686	124,878	240	15,515
6. Beverage Coolers Remote	245	19,921	1,879	116,677	212	14,008
<b>Condensing Units</b>						
7. Less than ½ Hp.	1,273	79,172	11,464	659,074	599	35,306
8. ½ to 1 Hp. Inc.	5,013	389,824	9,201	912,543	1,723	162,555
9. Above 1 ½ and less than 1 Hp.	1,074	155,132	4,297	613,274	665	91,448
10. Total Lines 7, 8, and 9	7,360		25,231*		2,987	
11. Total Lines 1, 3, 5, 10	14,951		40,601*		6,371	
12. Evaporators	5,963	183,454	24,385	773,780	2,979	105,961
13. Miscellaneous Cases and Cabinets	48	8,631	550	164,492	133	43,036
14. Total Commercial		\$1,659,730		\$5,548,003		\$815,467

\*These totals are not the sum of the breakdown figures as two companies did not report on individual items. Note: Three companies do not supply figures on Factory, Branch, and Warehouse Inventories. Nine companies do not supply figures on Distributors' Inventories.

## Exports of Electric Refrigerators (January, 1935)

	Electric Household Refrigerators		Electric Commercial Refrigerators Up to 1 Ton		Parts for Electric Refrigerators	
	Number	Value	Number	Value	Number	Value
Austria	12	\$ 1,076	1	\$ 150		\$ 654
Azores and Madeira Islands			1	333		
Belgium	17	1,118	47	4,784		5,557
Czechoslovakia			4	1,226		3,472
Denmark	2	145	17	2,367		817
Finland	5	286	7	702		767
France	287	21,404	112	13,612		22,364
Germany	1	114				3,371
Gibraltar	1	83	1	97		94
Greece	9	946				61
Hungary	2	192				18
Irish Free State	6	384				639
Italy	196	15,159	66	6,935		20,637
Malta, Gozo, and Cyprus	1	112				14
Netherlands	287	17,768	29	1,645		7,450
Norway			7	1,170		1,179
Poland and Danzig			1	145		172
Portugal	8	810				195
Rumania						1,866
Spain	13	1,230		1,307		3,008
Sweden	43	3,422	40	4,969		4,587
Switzerland	27	1,534	8	861		23,276
United Kingdom	1,111	64,198	455	19,376		79,082
Yugoslavia	3	191	10	605		886
Canada	47	2,789	8	2,929		46,886
British Honduras						58
Costa Rica	12	1,307				52
Guatemala	13	1,278				14
Honduras	11	1,565	4	978		20
Nicaragua						705
Panama	33	4,382	4	779		66
Salvador	2	198	1	232		1,746
Mexico	67	5,981	15	2,258		514
Bermuda	9	1,148	1	202		114
Barbados	6	619				490
Jamaica						219
Trinidad and Tobago	15	1,398				27
Other British West Indies	14	1,445	2	228		463
Cuba	104	10,683	3	151		39
Dominican Republic	11	789	2	1,231		19
Netherlands West Indies	59	6,856	3	83		6,705
French West Indies	5	356	2	3,331		8,351
Haiti, Republic of	10	1,092	35	7,974		386
Argentina	22	1,796	64			14
Brazil	907	71,022				147
Chile	10	1,166				56
Colombia	131	12,857	2	649		755
Ecuador	17	1,237	10	2,101		399
British Guiana	13	760				299
Surinam	5	514				81
Peru	95	9,281	1			9,752
Venezuela	39	3,089				706
Aden	4	1,801				105
Saudi Arabia	295	28,535	59	7,327		2,476
British India	90	8,832	4	782		2,800
British Malaya	21	1,596				16
Ceylon	10	1,766				384
China	29	32,611	7	1,895		362
Netherlands India	38	3,805				9,888
French Indo-China	9	615				1,559
Hong Kong	24	3,338				73
Japan	263	23,295	54	7,065		29
Palestine	115	10,119	9	2,454		10,680
Philippine Islands	1	119				738
Syria	34	3,861				232
Turkey	1	61				9
Other Asia	242	11,288	2	149		13,949
Australia	1	100				2,263
British Oceania	132	9,389	10	753		126
New Zealand	12	1,264				81
Belgian Congo	18	1,941				401
British East Africa	713	63,637	51	5,595		708
Union of South Africa	18	1,494				22
Other British South Africa	8	714				365
Gold Coast	31	3,138				183
Nigeria	20	1,819				40
Other British West Africa	64	4,502	13	1,604		96
Egypt	17	1,643				
Algeria and Tunisia	3	381				
Madagascar	11	897				
Other French Africa	5	488				
Italian Africa	3	280				
Morocco	1	139				
Mozambique	5	451				
Other Portuguese Africa						
Canary Islands						
Other Spanish Africa						
Total	6,200	\$497,669	1,193	\$112,621		\$312,387
Hawaii	317	28,146	13	3,517		5,566
Puerto Rico	155	19,132	6	952		952
Virgin Islands	1	121	1	175		



We are offering an attractive proposition to responsible distributors and refrigeration dealers.—Full protection.—Write immediately for catalogue and prices.

**FOGEL REFRIGERATOR CO., 519 Bainbridge St., Philadelphia, Pa.**  
Refrigerator Manufacturer for over 35 Years



# REFRIGERATION NEWS

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## Dealers Plan to Protect Profits In Birmingham

### \$10 Limit Set on Ice Box Trade-ins; Jobbers Urge Bans on Other Practices

BIRMINGHAM, Ala.—Adoption of a resolution limiting ice box trade-ins to \$10 marked a heavily attended session of the Birmingham Electric Refrigeration Bureau recently, at which time John Shaw, president, characterized the business of selling electric refrigerators in Birmingham as a "sick baby."

The bureau was called to act on a set of recommendations made by Birmingham jobbers, which included a \$5 allowance for ice boxes, no free merchandise beyond equipment furnished by the manufacturer, and no home demonstrations. The jobbers also suggested—although not unanimously—that a uniform commission be provided.

President Shaw referred to the fact that a number of evils had crept into the refrigerator selling business in Birmingham, including excessive trade-ins of up to \$50 for ice boxes, free demonstrations up to as much as 45 days, and the free grocery racket. Adoption of the \$10 trade-in basis was not unanimous, some dealers contending it useless to set such a figure as long as non-bureau members offered any and every allowance necessary to make a sale. Other dealers contended that the bureau should abide by its code of ethics adopted at the beginning of the season and not accept any ice box trade-ins at all.

The bureau failed to follow up the jobber recommendations on the elimination of home demonstrations and free merchandise, although the consensus of opinion was that such practices merely eat into the dealer's profits. Neither could any agreement be reached on uniform commissions and the amount of the cash payment on refrigerators.

At the beginning of the present season, it was said, Birmingham dealers abided by a strict code of ethics, but as the hot months wore on and competition became keener, the practices to which President Shaw referred became greater, causing some dealers to make less profits on greater sales than at the beginning. A desire to hold up profits for the remaining months of the selling season led to the joint meeting of jobbers and dealers.

## Borgstedt Will Manage Frick's New York Office

WAYNESBORO, Pa.—Frick Co. has named Henning N. Borgstedt manager of its branch office in New York City.

Mr. Borgstedt commenced his new duties with Frick Co. July 1. He is a member of both the A.S.R.E. and the A.S.M.E.

## Nema Postpones Meeting Until July 19

DETROIT—The scheduled two-day meeting of the Refrigeration Division of Nema at the Claridge hotel, Atlantic City, July 8 and 9, has been postponed and shortened to one day, July 19, it was announced Monday by Haldeman Finnie, consultant to Nema's Refrigeration Division.

The Household Refrigeration Section meeting will be held at 10:30 a. m., the general meeting of the Refrigeration Division at 2 p. m., and the Commercial Refrigeration Section meeting at 3 p. m., Mr. Finnie said.

## DeWees Joins Advertising Dept. of Stewart-Warner

CHICAGO—C. C. DeWees has been appointed assistant advertising manager of Stewart-Warner Corp., and will devote the major part of his time to directing advertising and sales promotion activities on Stewart-Warner radio and refrigeration, working under Advertising Manager Fred Cross.

Mr. DeWees was previously associated with the Grigsby-Grunow Co.

## 3,317 Refrigerators Sold in 5 Months By Georgia Power

ATLANTA—A total of 3,317 household electric refrigerators were added to the lines of the Georgia Power Co. for the first five months of this year, as compared with 1,500 units for the same period last year, recent reports of the power company show.

Other electrical appliances also showed gains over last year, but most of them were not as great as that shown in the refrigerator field.

Ranges installed on Georgia Power line through May totaled 1,510 units, as against 1,253 in 1934. Water heaters were 808 in 1935 against 596 in 1934, and cleaners 480 against 174.

## Lipman Adds Three New Distributors

BELOIT, Wis.—Three new distributors have been appointed by the General Refrigeration Sales Co. of this city to handle Lipman commercial refrigeration and air-conditioning equipment.

New distributors are Ruegg Refrigeration Sales Co., Beatrice, Neb., Southwest Refrigerators Co., Inc., El Paso, Tex., headed by Harry L. Hussmann, Jr., and Dixie Engineering & Supply Co., Memphis, Tenn.

The Dixie Engineering & Supply Co. is headed by T. L. Jackson, assisted by W. E. Thorpe, formerly with the Sturtevant Co. at Boston.

## York Cools Hershey's Windowless Office

HERSHEY, Pa.—Now being erected here is a new air-conditioned, windowless office building to house the executive offices of the Hershey Chocolate Corp. Air-conditioning equipment will be installed by York Ice Machinery Corp.

Latest technical knowledge in the sciences of modern lighting, air conditioning, and building construction is being incorporated in the design of the new structure, so that although it will be entirely without windows, it will be supplied with an ample volume of fresh conditioned air, free from dust and impurities, and automatically tempered as to humidity and temperature.

Proper insulation of the building and the elimination of heat leakage through windows is expected to result in appreciable reduction of both the summer cooling load and the winter heating load, so that an overall decrease of 25 per cent in the cost of operating the air conditioning is predicted through adoption of this new type of construction.

The essential elements of the air-conditioning plant will consist of a 135-ton water-cooling system, located in the basement of the building, which will furnish refrigeration for the two air-conditioning systems, one of which serves the second floor and the other the third floor.

Interior conditions to be maintained by the two systems are 80° dry bulb and 65° wet bulb in summer, and 75° dry bulb and 48 per cent relative humidity during the winter season. Each system is equipped with a washer-type dehumidifier.

A complete system of fans, ducts, grilles, etc., will provide circulation of conditioned air at a rate of 90,000

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## Head Manages Cleveland G-E Distributorship

INDIANAPOLIS—A. F. Head, formerly vice president and general manager of Electric Appliances, Inc., G-E distributor in Indianapolis, has accepted the position of general manager of the General Electric distributorship at Cleveland.

D. M. Kersey succeeds Mr. Head in the Indianapolis operation.

Electric Appliances, Inc., has sold six complete electric kitchens, ranging in price from \$900 to \$2,000 during the past several months, Mr. Kersey reports. An increase in sales of refrigerators sold on the meter plan is partially due, Mr. Kersey believes, to special rates given the consumer by the Indianapolis Power & Light Co.

## Conservador Gets Another Ribbon



Fairbanks-Morse Home Appliances received two blue ribbons—one for their refrigerator Conservador, and one for their washing machine—for "useful inventions" at the National Inventors Congress held last week at the Hotel Sherman in Chicago. This is the second time the Conservador has been accorded such recognition. In the pictures W. Paul Jones, F-M vice president, watches the awarding, and makes his acceptance speech.

## Twin City Dealers Hear Hutchinson Report on Mail Order Competition & Ways to Meet It

ST. PAUL—Failure of refrigerator sales in St. Paul and Minneapolis to come up to expectations this spring was laid to two causes—unfavorable weather and vigorous mail-order house merchandising of low-price units—by F. M. Hutchinson, manager of the home appliance department of Motor Power Equipment Co., Fairbanks-Morse distributor, in a speech to Twin City dealers of all makes meeting last week under the auspices of the Motor Power Equipment Co.

Discussing the refrigeration situation in the northwest, as he saw it, Mr. Hutchinson said that while Sears,

Roebuck and Montgomery Ward had taken a considerable volume of business from dealers in other lines, much of their sales had come from a market which they had created, and which other dealers could not touch—the low-price field.

To meet this competition, which he said involved by far the largest potential market, he suggested a second line of refrigerators, priced in or below the mail-order house range—and honesty in merchandising it.

"This new business the mail-order houses are taking are the families whose budgets will not permit them to pay more than \$5 a month, and yet who need a good sized box if they are to gain the economies which may be effected with electric refrigeration," he said.

"To sell these families a box smaller than 6 cu. ft. is about the most unfair thing a dealer could do."

"Most families with incomes from \$80 to \$200 a month have a difficult time arranging their budget to buy even half the things they would like to have—and a great many of these families could buy an electric refrigerator if they would not be called on to pay more than \$5 a month. They all want one—but many cannot stretch that budget to cover a \$7 or \$8 a month payment; yet they need at least a 6-cu. ft. box."

"Sears' and Ward's have made it possible for these families to own the box they need at no more than \$5 a month payment—and in that sense, I say they have created new business, and widened the market."

While some dealers have recognized

(Concluded on Page 3, Column 1)

## Stewart-Warner Profit Larger in 2nd Quarter

CHICAGO, July 2—Preliminary estimates made today by company officials indicate that earnings of the Stewart-Warner Corp. for the three months ended June 30, 1935, will be slightly larger than the \$496,063 net profit reported for the first quarter of the year.

This will bring earnings for the half-year to around \$1,000,000, or approximately 80 cents a share on the common stock. In the six months to June 30, 1934, net profits were \$540,260.

Sales for the first half of 1935, it is indicated by preliminary reports, were approximately 20 per cent higher than in the first half of 1934.

While improvement in earnings has been registered by every division of the company during the first six months of 1935, officials indicated that a particularly encouraging showing had been registered by the radio and refrigeration divisions. While no exact figures are available as to results from these two divisions, it is understood that substantial out-of-pocket losses for these two items in the first half of 1934 have been translated into modest cash gains in the first six months in 1935.

## 1 Million Units Sold by Industry In First 5 Mos.

### 261,100 Household Units Sold to Distributors During May

By A. J. Cutting

DETROIT—Record-shattering performance was established during the first five months of 1935 when industry manufacturers sold approximately 1,000,000 household electric refrigerators to all distribution outlets, according to preliminary estimates made by ELECTRIC REFRIGERATION NEWS. Sales for 1935 are 26 per cent ahead of the same period of 1934 when the estimated total was 793,500 units.

Industry sales to distributors and dealers during May were estimated at 261,100 being about 3 per cent below May of last year when 268,600 refrigerators were shipped by manufacturers. The 1935 May figure is the first which has shown a decrease in comparison with the same month of last year.

Inventories held by distributors at the end of May were considerably higher than was the case at the same time last year.

May shipments of household refrigerators by 14 members of the Household Refrigeration Section of the National Electrical Manufacturers Association (Nema) totaled 237,609.

In the first five months of the current year, Nema companies have sold 912,587 household electric refrigerators to distribution outlets. However, the fact that distributor inventories held May 31, 1935, are considerably higher than in 1934, hints that retail sales have not kept pace with factory sales. Holdings reported for distributors of 15 concerns in 1934 totaled 81,281 while distributor inventories for only seven companies in May of this year were given at 120,762.

Companies reporting to the Household Refrigeration Section in May were Apex, Crosley, Frigidaire, General Electric, Gibson, Kelvinator, Leonard, Norge, Servel, Stewart-Warner, Sunbeam, Uniflow, Universal Cooler, and Westinghouse. Nema members not reporting were Jomoco, Merchant & Evans, and Sparks-With-

(Concluded on Page 16, Column 4)

## Branch Managers of Fedders Convene

BUFFALO—Fedders Mfg. Co. branch managers and field representatives met here last Thursday through Saturday in the national mid-year sales convention, the three-day program being consigned to presentations of engineering developments, sales and advertising plans.

Thursday's sessions were devoted to engineering discussions led by Joe Askin, chief engineer; and L. C. Smith, executive engineer.

The Friday program included sales discussions presided over by H. E. Rieckelmann and W. D. Keefe, and a presentation of advertising objectives by Horace Laney, head of the advertising agency which handles the Fedders account.

Friday night L. F. Fedders, president and general manager, and T. C. Fedders, vice president and assistant general manager, were hosts to the conventionites at a dinner held at the Park Lane.

Saturday the field representatives participated at the annual all-day Fedders' employees' picnic held at Cooanut Grove on the shore of the Niagara river.

Among those attending were the following branch managers and field representatives: Franklin G. Slagel, Los Angeles; Leo Freitas, Dallas; Frank Haag, New York City; Henry Sherman, Cincinnati; Marc Shantz, Chicago; and Charles P. Rittling, Buffalo.

## Manufacturers Pay Tax of \$1,022,847 on May Sales

WASHINGTON, D. C.—During May, manufacturers of mechanical refrigerators paid into the Bureau of Internal Revenue \$1,022,847 in taxes as against \$551,636 for May of last year.



H. W. NEWELL



## Salesman Sells Nine Jobs in One Day

KNOXVILLE, Tenn.—One man, in one day, sold and equipped nine homes with electric refrigeration and wiring for other electrical equipment and fixtures, during a house to house canvass of 22,000 homes here. A utility company had 23 salesmen make the canvass.

The salesman contacted the people who lived in each of these nine homes, and they agreed that if the owner would wire these homes and put in electric refrigeration, they would consent to an increase of \$5 per month in their rent. The owner immediately agreed to the proposition.

## Michel Elected Vice Pres. Of St. Louis Utility

ST. LOUIS—C. W. Michel, formerly sales manager of the Union Electric Light & Power Co., and well-known in appliance merchandising circles, has been elected a vice president of the organization.

**MCCORD**  
*Refrigeration*  
**PRODUCTS**

COMMERCIAL EVAPORATORS  
DOMESTIC EVAPORATORS  
CONDENSERS  
METLFLEX ICE TRAYS  
SPIRAL FINNED TUBING  
SPIRAL COPPER FINNED IRON, STEEL OR COPPER PIPE  
MCCORD RADIATOR & MFG. CO., DETROIT

## Miss Gordon Gives 11 Rules for Making Frozen Desserts

DETROIT—Miss Mary Lee Gordon, home economist for Leonard Refrigerator Co. here, has recommended the following 11 rules for making frozen desserts:

1. Make all measurements accurately, especially when measuring sugar, as too much sugar will actually lower the temperature at which a mixture will freeze.
2. Do not use cream which is too rich in butter fat; 28 to 30 per cent is sufficiently heavy.
3. Do not whip cream too stiff; whip only until it is fluffy, and at the same time thin enough to pour from the bowl.
4. Egg whites should be beaten until quite stiff; until they hold a peak and are on the verge of dryness.
5. All fruits, nut meats, and vegetables must be cut in very fine pieces, crushed, or pressed through a sieve.
6. Drain all fruits thoroughly; as excess moisture will cause long ice crystals to form.
7. Mixtures should be thoroughly chilled and of the same temperature when folded together. This is especially true when whipped cream is one of the ingredients.
8. Mixtures should be as near the same consistency as possible when folded together.
9. Air is incorporated to insure a fine texture. Be sure to fold gently when combining mixtures.
  - a. In the quick freezing tray, desserts should be stirred after egg whites or whipped cream have been added.
  - b. In making sherbets and ices, freeze the fruit syrup to a heavy mush, whip, and fold in egg whites. Complete freezing without stirring.
10. If no cooking is to take place, always use powdered sugar. Granulated sugar may be used in recipes requiring cooking.
11. The more rapidly a mixture is frozen the smoother will be the texture. Freeze in the quick freezing tray. The lowest single-depth tray in the freezing unit gives the fastest freezing speed in the Leonard.

## Grunow Advertisement Analyses Features

BOISE, Idaho—A "complete buyer's analysis of the refrigerator market" is the theme of an advertisement run recently by Oakley's, Grunow dealer here.

The advertisement begins with a chart giving "basic features to look for in a refrigerator." Below the chart is copy under the following headings: "Read these Facts," "Only 'One' Intelligent Way to Buy," and "Insist on the Safety Test."

Glancing down the advertisement, boxed in copy regarding the following, meets the eye: "Facts about Carrene," "Compressor and Motor," and "Dependability." At the bottom of the ad is a boxed-in list of Grunow dealers in and around Boise.

## 'Home of Tomorrow' Institute Course Is Outlined in Booklet

MANSFIELD—A new 22-page, two-color booklet, devoted to the Westinghouse Home of Tomorrow Institute here, has been issued by the Westinghouse Electric & Mfg. Co. The booklet describes the staff, equipment, eligibility of attendance, and the practical courses of training and instruction offered at the Home of Tomorrow Institute.

The pamphlet is illustrated with pictures of the staff, living accommodations for home economists taking the course, and class rooms, and kitchens.

Pages 15 through 17 are devoted to an outline of the courses given in (1) home economics and electric cookery, (2) home service and refrigeration, and (3) home cleaning and laundry equipment.

The refrigeration program is divided into four parts as follows:

1. *The Home Economist—A Vital Factor in Refrigerator Sales.* One of the phases of home service work particularly stressed is the type of help that a home economist can give retail salesmen. Information is given on how to guide salesmen in selling the proper sizes of refrigerators and how to train salesmen in the actual use of a refrigerator.
  2. *Care and Proper Use of the Electric Refrigerator.* Enough of the theory of electric refrigeration is included to make the proper placing of foods, the ordinary operation of the units, and the flexibility of the temperature control more understandable.
  3. *Preparation of Desserts and Other Foods in the Electric Refrigerator.*
  4. *Planning Cooking School Demonstrations.* Special training in the presentation of cooking schools and dramatic demonstrations for mass selling purposes is available to those who complete their preliminary work in refrigeration. The course includes menus for special demonstrations and teaches the mechanical routine for every type of cooking school.
- A reproduction of the certificate awarded to those who complete the entire course is shown on page 21 of the booklet.

## Sales of Ice Boxes in California Increase

SAN FRANCISCO—How modern merchandising methods and improvements in their product have helped the ice industry in meeting competition from electric refrigerators are shown in a report recently issued by the California Association of Ice Industries.

Sales are steadily increasing, records reveal. In San Francisco, ice refrigerator sales were 78 per cent higher in May, 1935, than in May a year ago, with 130 units sold. This was 7 per cent higher than the percentage of increase in northern California as a whole, where 1,124 ice refrigerators were sold during the month.

So far this year, 2,339 ice refrigerators have been sold in northern California, an increase of 40 per cent over last year. San Francisco sales for the five-month period increased 37 per cent.

Increased purchasing power through FHA loans, advertising telling the story of ice refrigeration, substantially reduced prices, and improved equipment were among the reasons given for the increase, which is considered particularly noteworthy in view of the fact that sales of electric refrigerators have also been increasing in the state.

## Salesmen Will Write Westinghouse Manual

MANSFIELD—In an effort to get the best possible material for inclusion in a sales manual which will apply to refrigerator floor sales in department and major furniture stores Westinghouse will invite refrigerator salesmen throughout the country to participate in its preparation, according to V. E. Vining, department store sales supervisor.

This participation will take place in the form of a contest, details of which are being sent to stores. Contestants will be asked to make detailed analysis of five of their refrigerator sales, pointing out which factors in salesmanship which, they feel, put the sale over.

## Crosley Sales Increase In First 5 Months

CINCINNATI—Sales of Crosley electric refrigerators for the first five months of 1934 showed an increase of 47.9 per cent over sales for the corresponding period of 1934, Lewis Crosley, vice president and general manager, reported last week.

## High School Students To Find Prospects For Stern & Co.

HARTFORD, Conn.—High school students of Connecticut, Vermont, and western Massachusetts will have an opportunity to spend four days next spring visiting the National Capital, with all expenses paid, under terms of a sales promotion contest on Grunow refrigerators sponsored by Stern & Co., Inc., Grunow distributor in this area.

The contest, which will close Dec. 31, entails (1) the use of high school students as "bird dogs" in hunting up prospects for dealers in the various communities, and (2) the arousing of interest in the Grunow vacuum method of refrigeration through "object lessons" in high school science and chemistry classes.

Organizations, known as "Carrene-Washington Clubs," are being formed by dealers in the Stern organization, and students who join are given a sterling silver membership badge, and the story of the Grunow-Carrene method of refrigeration, together with details of how they may qualify for an expense-free trip to Washington.

### To Work with Students

Theory behind the contest, says F. E. Stern, president of Stern & Co., is that children of high school age know when their families and friends are planning to purchase electric refrigerators and other appliances, and that if given an incentive, such as a trip to Washington or cash awards, they will do much toward swinging sentiment toward Grunow products.

Dealers are being encouraged to work, wherever possible, through school principals, science, chemistry, and physics teachers, and boys' and girls' clubs. Demonstrations in various science and chemistry classes will explain the vacuum method of refrigeration, as a supplement to the child's knowledge of other refrigeration methods, such as gas pressure, and ammonia absorption.

When he registers for the contest, the student-salesman is given a booklet containing the Grunow-Carrene story, and a folder in which the names of prospects he turns in are listed, and in which the sales he is instrumental in obtaining are recorded by means of stamps—one stamp-mile for each \$1 of retail sale price.

### \$800 in Sales Needed

To qualify for the trip, the student must have 800 stamp-miles in his book by Dec. 31—in other words, he must have been instrumental in selling \$800 worth of refrigerators.

Students who do not qualify for the trip on the basis of sales may apply their sales against the cost of the trip, at the rate of 5 cents per mile, from 200 miles up, 2½ cents in cash, in case their "mileage" is over 400 and under 800 miles. Cost of the trip is estimated at \$40 per person.

As an added incentive, Stern & Co. is offering a grand prize of \$100 to the student who has the highest mileage as of Dec. 31, provided this total exceeds 1,500. In addition, for those children who do not have sufficient mileage to qualify for the trip, Stern has provided two options, (1) payment by the child or its parents of the addition to make the trip possible, or (2) cash payment to the child at Christmas time, for use in buying gifts.

Children with low mileage totals may also interchange stamps between them, at the discretion of the individual dealer, so that where several children are entered, at least one of them can make the trip to Washington.

### Small-Mileage Prizes

Prizes to these small-mileage contestants will not be paid by Stern & Co., but will be met by the dealer in that community. Where a child has earned substantial mileage, and does not wish to interchange with his fellow-contestants, he may turn in his mileage for cash, at the rate of 2½ cents per mile.

Participants in the contest will not be turned into salesmen. Their duty will be to act merely as "bird dogs," digging up the prospects which the dealer, in his turn, will attempt to close. A trained salesman will work with each group, acting as "closer" to the prospects which the student-salesmen turn in.

If the student mentions to the prospect that purchasing a Grunow will help him make a trip to Washington, Mr. Stern believes, the Grunow-Carrene sales argument will be helped along considerably.

To keep the dealer active and interested in the contest, Stern & Co. is offering any dealer qualifying four or more children for the Washington trip a chance to make the trip himself, at no expense. Dealers who qualify less than four may also make the trip, by paying a portion of the fare pro-rated on the number of children less than four that he has qualified.

## Buyers Will Receive Awards in Norge's 'Test' Campaign

DETROIT—To whip the "summer slump," Norge Corp. is turning July into "Norge National Test Month," with 50 refrigerators, 50 gas ranges, and 50 washers as prizes for the best records of home tests made by anyone who is a Norge owner before July 31.

The hope of winning one of these prizes, Norge officials believe, will form a buying urge to prospects through all of July, will encourage present Norge owners in the purchase of additional Norge products, and will stimulate salesmen to new efforts in an otherwise lethargic season.

Distribution of the prize refrigerators, ranges, and washers will be made on a national basis, allocated as much as possible to cooperating distributor territories.

A "home approval plan" has been developed, which offers to any purchaser of a refrigerator, range, or washer during July the privilege of conducting home tests. If the product does not meet these tests, outlined in a specially prepared Norge Home Test book, the deal may be cancelled, and the product returned without any expense to the prospect.

The plan practically eliminates the repossession hazard, since home approval is based on the product's ability to meet certain minimum tests, as set up in the Norge Test book, and has actually been purchased, instead of having been placed on free trial. Survey estimates reveal, officials say, that even on a free trial basis the repossession hazard is only about 3 per cent.

But, since the product is installed with the understanding that it can be returned only if it fails to meet certain minimum tests, and these are of a nature that surely can be met, the home approval plan is distinctly not a free trial, although it may be diplomatically handled as such.

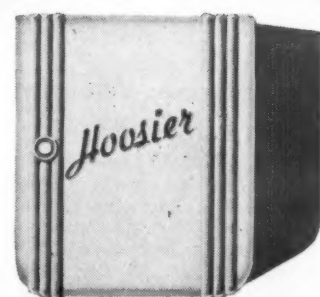
Each distributor or dealer is privileged to determine the length of time that will be given each owner to perform these tests, and the minimum ratings are such that any Norge product can easily conform to them. The tests are outlined in a book titled, "Norge, My Record," which will be distributed to owners in connection with the campaign.

Arrangements have been made with Norge's official finance agency to support the sales program with a special "no down payment" arrangement, providing maturities up to 36 months on single appliance purchases, and up to 48 months on combination sales.

Where a finance plan is used calling for a down payment, that is to be refunded by the dealer in case the owner wins one of the prizes under the "test" plan, or if she decides to return her range, refrigerator, or washer after the Home Approval period has ended.

Arrangements concerning finance plans and return agreements are being handled by the Norge distributors who are cooperating in the campaign.

Smart, Attractive  
**INTERIORS**  
Sell Refrigerators



EVAPORATOR DOORS,  
VEGETABLE FRESHENER  
and SERVICE DRAWER FRONTS

In our newly developed finishes  
of Special Alloy Aluminum

ICE CUBE and DESSERT TRAYS  
VEGETABLE FRESHENERS  
STORAGE PANS

**HOOSIER**  
LAMP & STAMPING CORP.  
EVANSVILLE, INDIANA

*Your Big Opportunity*

**COPELAND**  
COMMERCIAL REFRIGERATION

- Complete Line
- 30 Models
- Veteran Engineering
- Precision Manufacturing
- High Efficiency
- Low Operating Cost
- Long Life

COPELAND is taking commercial refrigeration business away from all competition because Copeland has the background, the experience, the ability and the product. Copeland has specialized in refrigeration since 1918. Alert distributors in the commercial field are doing a big business with Copeland because they are fortified with a famous line that has a unit to fit every kind and size of commercial application.

**COPELAND REFRIGERATION CORPORATION**  
Manufacturers of a Complete Line of Household and Commercial Refrigeration  
Holden Ave. at Lincoln... DETROIT, MICH.

**Copeland**  
DEPENDABLE Electric REFRIGERATION



## Hutchinson Analyzes Competition of Mail Order Refrigerators

(Concluded from Page 1, Column 4)

this situation, others have "preferred to hide their heads in the sand, like the ostrich," Mr. Hutchinson said, claiming that such buyers were "Sears or Ward minded," and that they couldn't sell them anyway—inferring that their customers would not go to their companies for refrigerators.

Mr. Hutchinson discounted this argument. "Human nature has not changed," he said. "Our customers are our customers only so long as we can offer them the most for their dollars—and I, for one, believe they will always be so."

"I do not believe that people buy on price only. I believe the American people want and buy the best they can afford. This is evidenced by the sale of Oldsmobiles, although Ford, Chevrolet, and Plymouth sell for much lower prices."

"So it is with refrigerators. Many still want all of the wonderful features that only the higher priced refrigerators can give them, but many more who want electric refrigerators cannot afford to pay for the luxuries—or even the economies and longer life—that higher priced boxes might give them."

### Two Distinct Markets

"We have two distinct markets for refrigerators today—those who can afford to buy electric refrigerators with the refinements and gadgets and conveniences that the ingenuity of clever manufacturers have been able to devise, and those who want automatic mechanical refrigerators, but cannot afford to pay for the refinements and economies. Of course, the latter is the largest class."

Attempts to meet this price situation have been half-hearted, Mr. Hutchinson said. One manufacturer offered a 5-cu. ft. 1934 model unit for \$139, another a three-year-old 6-cu. ft. model for \$139.50. Two leading department stores, he added, had recent sales, in which nationally advertised makes were offered at \$139.50, but which failed to reach quantity sales.

"If you are seeking the business that is going to the mail-order houses," Mr. Hutchinson told the dealers, "you must have a price less than Sears' and Ward's."

### Didn't Try to Sell Them

"Some of you will say that some dealers have had boxes priced at less, and that no great sales resulted. I agree with you—but did those who offered such great values try to sell them? I wonder if we haven't forgotten some of the fundamentals of what used to be good merchandising."

"People do not like to admit they cannot afford to pay as much as anyone else. When you advertise a big value in an electric refrigerator, and then attempt to sell them something else, they will usually tell you 'we are not quite ready'—'we will think it over'—'we will see you again'—and then go out to Sears' or Ward's and buy a refrigerator which Sears' and Ward's salesmen tell them is a tremendous value—and they are telling the truth."

"I have heard some of the many stories about Sears' and Ward refrigerators. I have been told that Sears' cabinet is cheap, and weighs less than other good cabinets—but, whether the cabinet weighs less or more, I know the Seeger Co. doesn't and won't build a cabinet which would fail to do the job for which it was intended."

### Consumers' Research Report

"I have been told to read the Consumers' Research, and that in its pages I will find what a miserable product these two great houses are putting out—but, to my way of thinking, I might just as well read the speeches of Gen. Johnson to hear the truth about Father Coughlin, or read the efficiency test records of General Electric to learn the cost of operating a Frigidaire, as to go to the Consumers' Research Magazine."

Only bright spot on the refrigeration horizon for dealers in higher-priced lines, Mr. Hutchinson said, is that the mail-order houses have bought only 150,000 units this year, and that their sales will reach only 15 per cent of the total, assuming sales of a million units.

"This won't be true next year," he declared, "because the number of prospective buyers who can afford to buy a 6-cu. ft. box for \$5 a month is much larger than the number who can pay more. In our own territory, Sears' and Ward's proportions may be much larger, because our people in the northwest are thrifty, and pretty good judges of values."

"At any rate, you cannot afford to neglect that market."

"What must you have to get more than your share of the better box business—is it mechanical superiority or refrigerator? I think not."

"The auto trade used to sell autos by showing a stripped chassis and

talking about bore, stroke, and lubrication—but that isn't done today. Mr. and Mrs. Buyer know that almost any car they buy will be satisfactory from the standpoint of mechanical operation. Today they sell style, comfort, convenience, and gadgets. "Isn't the refrigerator business at about the same stage?"

Smart Fairbanks-Morse dealers, Mr. Hutchinson said, admit that all refrigerators are good—and build their sales talks around the extra economy and convenience which an F-M unit makes possible, featuring, of course, the Conservador.

To meet the price competition from mail-order houses, Mr. Hutchinson suggested that dealers take on, in addition to the line they now handle, a line of low-priced units which they can sell at prices which meet those set up by Sears and Ward.

A 6-cu. ft. model in these low-priced lines, he pointed out, can be sold in the Twin Cities for \$115, \$3.50 less than the mail-order house price on last year's unit of similar size. These refrigerators, he said, are quality products, using, for the most part, the same materials that are used by higher-priced lines, and similar to them in self space, insulation, and ice cube capacity.

"You remember the Model T Ford—

noisier than most cars, yet it put America on wheels, and many of those old Model T's are still doing their duty. No luxuries—just transportation."

The same thing, he said, applies to low-cost refrigeration.

"No luxuries, just good refrigeration, at a cost within the reach of millions of families who need ample storage capacity to properly store their food, and gain the economies of automatic refrigeration."

How to sell it, without spoiling the sales for higher priced refrigerators?

"Just tell the truth. Not as quiet as higher priced refrigerators, no gadgets, maybe not lifetime refrigeration—but a refrigerator that will do the essential things that any good refrigerator is designed to do, for as many years as its price justifies, and maybe more."

### Lindsay Visits Crosley Dealers in Europe

CINCINNATI—For the purpose of aiding cooperation between the Crosley factory and distributors in the export field, A. G. Lindsay, manager, foreign division, Crosley Radio Corp., has sailed on a 10 weeks' trip to Europe.

## Restrictions Placed on TVA Powers by House Of Representatives

WASHINGTON, D. C.—A House of Representatives committee has modified in several respects a bill clarifying and enlarging the powers of the Tennessee Valley Authority, sent to it after passage by the Senate.

As approved by the Senate, the amendments to the TVA act would increase the TVA's bond-issuing power from 50 to 100 million dollars, and extend its operations to the Cumberland Valley.

Restrictions placed on the measure by the House committee would:

1. Limit TVA bond-issuing power to 50 million dollars.
2. Forbid it to build facilities paralleling those already in existence. This would take away a powerful bargaining weapon in its negotiation for purchase of private systems, restricting the TVA to condemnation proceedings in case the price offered to a private company was considered not sufficiently attractive.
3. Compel it to place its accounting system under the authority of the

Comptroller General's office. This would involve letting all contracts to the lowest bidder, subject to the adjudication of appeals by the Comptroller's office. According to TVA's Chairman Morgan, an attempt to follow such rules in the early days of TVA's operations resulted in a loss of half a million dollars on account of the delays which it necessitated.

4. Forbid the sale of power and chemicals below cost of production after July 1, 1937, the cost to be determined by rules laid down by the Federal Power Commission. This provision brings up the vexed question of depreciation, on which the "cost of production" chiefly hinges and which goes to the heart of the "yardstick" idea.

5. Forbid the acquisition of real estate not required for operations, and compel the sale of such land already acquired. This prohibition is aimed at such action as that taken to block the building of a dam by the Aluminum Corp. of America except in accordance with plans of the TVA for development of the Tennessee Valley resources.

Another attack on the TVA's program was delivered in the House debate on deficiency appropriations, which carried an item of \$35,000,000 for the authority.

# A few lines from the "FREON" DRAMA



Mr. Smith—(speaking over telephone)—Is this Mr. Murray?

Mr. Murray—Yes, Mr. Smith.

Mr. Smith—Please deliver a five-pound box of chocolates to my wife about four this afternoon.

Mr. Murray—We shall be glad to, Mr. Smith. Thanks for the order.

Mr. Smith—By the way, Murray, what do you make those chocolates out of? My wife thinks they are superb.

Mr. Murray—We use the best ingredients money can buy—and to keep our candies fresh and in perfect condition, we have "Freon" air-conditioning in both our factory and our store.

Mr. Smith—I have been reading and hearing about "Freon" air-conditioning. Is it any good?

Mr. Murray—I wouldn't use anything else. "Freon" is a safe refrigerant, and I have to think about the health and welfare of my employees. Besides, if the system leaks, it will not damage my candies. There is no hazard to customers who come to the store to buy, and so my public liability insurance rates are very low.

Mr. Smith—I have never thought of it in that light. Is the equipment good and tight?

Mr. Murray—I understand, Mr. Smith, that refrigerating machinery manufacturers are making better equipment for "Freon" than they have ever made for any other refrigerant. Efficiency ratings are very high, and my refrigerant losses are very small.

Mr. Smith—Glad to know that, Murray. I'll close the order today for that "Freon" air-conditioning system for the office that Mr. X has been trying to sell me. Good-bye, and many thanks.

Finis

Are you Mr. X? You can be if you plug "Freon" air-conditioning equipment exclusively and whole-heartedly. There are many Smiths and Murrys right in your city, awaiting a call from a convincing salesman.



# FREON

REG. U. S. PAT. OFF.

a safe refrigerant



"Freon" air-conditioning system by Frigidaire at Cunningham's Drug Store, Detroit, Michigan.



At Mrs. Stover's Candy Store at Wichita, Kansas, candies are kept fresh and full-flavored by Frigidaire air-conditioning system. "Freon" is the refrigerant.



This leading confectionery store provides cool comfort with a Westinghouse "Freon" air-conditioning unit.

KINETIC CHEMICALS, INC., TENTH AND MARKET STREETS, WILMINGTON, DELAWARE



## PERSONALITIES

By George F. Taubeneck

### Philadelphia

With WILLIAM RANDOLPH HEARST finding communists as numerous on the national landscape (and especially on college camp) in 1935 as Indians were in the Pennsylvania woods back in 1682, it gives us no little pleasure to reflect upon the history of a city so intrinsically American as Philadelphia.

Most text-books give the date of the founding as 1682. That simplifies matters a great deal, and eliminates details that would in themselves take a whole book in the telling.

However, it is not only more correct, but much more interesting to know that the founding of Philadelphia took place in the year 1661, when William Penn was a young undergraduate student at Oxford and went to mingle much dreaming of an Utopia with his daily studies.

In that year it was that circumstantial accident—which has more to do with the Fate of Nations, and individuals, than people with orderly minds like to believe—dropped into one boudoir its customarily ill-assorted bedfellows, and made possible the germination of Philadelphia.

Charles, merry monarch of Merrie England at the time Penn was spinning dreamwebs of ye Perfect State, owed William's father quite a sum of money.

The easiest way to repay it was to grant Admiral Penn a sizeable slice of land in the New World. The admiral didn't know whatinell to do with it, so he gave it to William. Penn, the younger, was thereupon appointed proprietor of the province.

To William this was no sentence to a solitudinous sojourn in bleak wastes, as it might have been to many of his youthful contemporaries. Rather, it was an opportunity to give a laboratory test to some of his theories on civic economy.

"Sylvania" was the name chosen for the tract, until Charles, feeling impish, prefixed the name "Penn," and was so pleased with his jest that he refused to relinquish it, and so spelled out the name "Pennsylvania" in the original charter.

Three ship loads of liberty-seeking Quakers set sail from England for Pennsylvania on an autumn afternoon in 1681. Penn was unable to accompany these venturesome wearers of the wide-brimmed hats, but he did give his appointed commissioners strict orders concerning the city which they were to establish.

He instructed them in a letter dated Sept. 30, 1681, to build upon "a spot that was most navigable, most dry and healthy, and where boats might load and unload without lighterage."

"Let the rivers and creeks be sounded on the Pennsylvania side of the river Delaware . . . in order to settle a great town . . . where ships may best ride . . . Be sure to settle the figure of the town, so that the streets may be uniform . . . Let every house be placed in the middle of its plot, as to the breadth-way of it, so that there may be ground on each side for gardens or orchards . . . so that it may . . . always be wholesome."

How well they obeyed the suggestions of their leader is still evident in the Philadelphia of three centuries later.

About a year after the first Quakers left England for the New World, Penn followed. He was delighted with what his commissioners had accomplished, particularly with the site they had selected for his "Great Towne." Also he was pleased with the moral tone of this community of Quakers—the tenets of which religious sect he had embraced devoutly and wholeheartedly.

It is not generally recalled that Samuel Pepys—the gentleman of the

and-so-to-bed diary—was acquainted with William Penn. Quotations from his diary prove that he was, although it cannot be said that he was in sympathy with Penn's religious tendencies.

"Mr. Penn, who has lately come over from Ireland, is a Quaker again, or some such melancholy thing," wrote Mr. Pepys. Penn was a Quaker, all right (and Philadelphia as a result became the "Quaker City") but that he was at all "melancholy" is not verified by historical accounts of the man.

Philadelphia had been envisaged and completely laid out before a single piece of sod was turned. The streets were to be 40 and 50 feet wide; and there were to be 29 of them, covering two squares in gridiron design.

For the center was planned a square of 10 acres, having public buildings at each corner; and equidistant and toward each direction of the compass, four squares of eight acres each. These squares may be seen in Philadelphia today.

The modern city is simply an extension of the Great Towne of Penn's dreams, with original features intact in the very old parts of the city. It comes as close as anything American to approaching an Old World preservation of origins.

William Penn had the pleasure of seeing his dream of "a city of peace and brotherly love" fulfilled. But he could not know that less than a century after its founding such patriotic giants as Franklin, Washington, and Jefferson would be walking the streets of that city. It was destined to become the most important city in American history.

Penn's beloved "greene countrie towne" of 1682 had a population of 500. By 1935 his serene village had become the third metropolis in the United States with a population of about 2,500,000 and the greatest City of Homes in the western hemisphere.

Thousands of travelers annually tarry in Philadelphia to seek out the tangible mementos left by the Founder and other great men who followed him. For teachers, students, and the historical-minded it is truly a mecca. And certainly even the indifferent-to-tradition visitor generally takes time to visit such places as (here we go on a sightseeing tour):

### Touring the City

Independence Hall is the most famous building in American history. In its unctuous confines was signed the Declaration of Independence, July 4, 1776. Here, too, George Washington was chosen Commander-in-Chief of the American Army (1775).

At the entrance to the Hall stands a bronze figure of Washington, a replica of the original statue (which was removed because of its sad disintegration).

The Hall was in almost continuous use for more than a century by various public offices and societies. Now it is a well-protected shrine. It comprises three main buildings: a central structure (the State House) with wings adjoining; and two smaller structures, one on Sixth and one on Fifth Sts., one erected for the county of Philadelphia and one for the city.

Andrew Hamilton himself designed the central building, and it remains one of the most beautiful examples of Colonial architecture in America. The other two buildings were added after the Revolution.

The East Room of the State House, which was the scene of the deliberations of the National Congress, still appears practically as it did at the time of that historic meeting. In its whitewashed, almost barren simplicity, it induces an attitude of hushed reverence comparable to that of a church during a noontide worship hour.

Here will be found a facsimile of the John Hancock original Declaration of Independence, and many portraits of men prominently identified with early American history—chiefly signers of that document. (How come we have no Daughters of Signers of the Declaration of Independence society in America?)

Chairs and tables used by the presidents of the Continental Congress are here, and on the table is the original silver inkstand, with its quill box and sand shaker, from which members of Congress dipped their quills in ink to sign the Declaration.

Liberty Bell hangs from its original beam in the main corridor of the Hall. Visitors are permitted to look at it all they wish, but not touch. It is closely guarded against vandalism. Already, you know, it has a bad crack in it.

Independence Hall and its museums

term and John Adams became Vice President.

After 1800 it was given over to the use of the criminal courts, and became popularly known as the "Slaughter House," because of the many murder trials held there. Today it, too, has been retired on a pension.

U. S. Supreme Court House, built in 1791 and occupied by the Supreme Court from 1791 to 1800 is located at the southwest corner of Fifth and Chestnut Sts. It is now occupied by the National Museum of the Sons of the Revolution. Original Pennsylvania charter and other historic relics are on view on the second floor.

Carpenter's Hall ranks second in Philadelphia only to Independence are open 9 a. m. to 4 p. m. week days, and on Sundays from 1 p. m. to 4 p. m. Admission is free.

Congress Hall, at the southeast corner of Sixth and Chestnut Sts., was once a wooden shelter for visiting Indians. The present building was completed in 1790. Until 1800 it was occupied by the Congress of the Nation. Here Washington was inaugurated President for a second

### What This Page Is All About

Although normally on this page the editor writes about PEOPLE in the refrigeration industry, as the title, "Personalities," would indicate, occasionally the theme is varied to include interesting PLACES in the refrigeration industry.

These little pieces about cities are written not only to amuse (and sometimes enrage!) citizens of the communities discussed, but to give sales executives a better picture of the various markets they are trying to capture.

Also, men in this lively industry move around frequently; and many have been kind enough to tell us that reading these little travelogues have helped them decide whether or not to move to another locality.

Hall in point of its historical significance. It stands in a narrow court off Chestnut St., between South Third and South Fourth Sts.

Within its walls was formulated the Constitution of the United States. During the Revolution the basement was used as a magazine for ammunition, and from 1791 to 1797 it was the home of the first U. S. Bank. It is now a museum and open daily, except Sundays, from 1 to 3 p. m. Admission is free.

"The Flag House," home of Betsy Ross, is open (free to the public) daily, except Sunday, from 8:30 to 5:30 p. m. Located at 229 Arch St. below North Third. Here in 1777 the first American flag was made.

William Penn's home—"Letitia House"—the first brick home in Philadelphia may be visited on Lansdowne Drive, west of Girard Ave. bridge in Fairmount Park. Walk in—it costs nothing.

Christ Church Cemetery, Fifth and Arch Sts., is oft visited because the remains of Benjamin Franklin, Dr. Benjamin Rush, and other early patriots lie buried beneath its sod.

Philadelphia has set aside nearly 6,500 acres as parks and squares. Of this area Fairmount Park occupies over 3,400 acres, contains 43 miles of drives, 44 miles of footpaths, and 12 miles of bridge paths. It extends on both sides of the Schuylkill River from Callowhill St. bridge north to Wissahickon Creek.

It is a place of great beauty, and—of course—contains many points of historic interest as well (practically every foot of Philadelphia is hallowed soil).

Bartram's Gardens, an area of some 30 acres, is situated between South 53rd, South 54th, and Eastwick Sts. and the Schuylkill River. This was the first botanical garden on the American Continent. It may be reached via the B & O Railroad or the Woodland Ave. branch of Rapid Transit Co., on the Walnut St. line.

These grounds were once the farm of John Bartram, celebrated botanist. Quaint old Bartram house, built by Mr. Bartram himself, still stands on the grounds.

Penn Treaty Park is on the Delaware River in Kensington. Here grew the famous Treaty Elm, beneath which William Penn is said to have made his agreement with the Delaware Indians in 1683. Wind blew the tree down in 1810; but the site is now marked with a small, plain monument erected by the Penn society in 1827.

Christ Church, one of the two most interesting places of worship in Philadelphia, had an important—if passive—part in the shaping of Colonial events. It was the original Episcopal diocesan church of Pennsylvania, and

### Wood-Sawer



Joe Donovan, manager of the General Electric air-conditioning department, doesn't say much these days, but saws lots of wood.

until the Revolution, the stronghold of the Anglican faith in America.

Present church building was begun in 1727 and completed in 1744. Original church was built in 1695.

Among the men who worshipped there were Franklin, Washington, and Robert Morris—the financier of the Revolution (whose name belongs in bigger type in the textbooks). Queen Anne sent over a communion service in 1708, part of which is still in use. Christ Church is on North Second St., just north of Market.

Old Swedes Church claims more hoary antiquity than Christ Church; but is lacking in historical associations because its congregation did not take the aggressive and combative activity in affairs political and governmental—leading to the subsequent rift with England—which characterized the Anglican church.

The present edifice was begun May 28, 1698. For 143 years it was the place of worship for Swedish Lutherans. Its communion service has been in use since 1773. The Old Swedes Church is at Swanson and Christian Sts., just east of Front.

St. Mary's was built in 1763, and enlarged in 1810. It is the original Roman Catholic cathedral of Philadelphia, and is located near Locust St. on Fourth.

St. Peter's retains much of its early colonial charm, and is still in use. Built in 1761, it is located at South Third and Pine Sts. This church also exercised noteworthy influence on history of the Colonies, having been a staunch ally and follower of the more aggressive Christ Church.

### Germantown

Germantown Ave., itself an historic thoroughfare, contains many places of particular interest to the visitor who wants to catch up on his antiquaria Americana. Follow us and see:

At the corner of Fisher's Lane is Hood's Cemetery, originally known as the "Lower Burying Ground," and one of the two first public burial places in Philadelphia.

Directly opposite the Soldiers' Monument is the house used as the Executive Mansion during the yellow-fever epidemic of 1793-94, where President Washington carried on the business of government for a year.

Just one door removed from this old mansion is an odd (in this day, at least) structure occupied almost uninterruptedly for nearly two centuries by members of the Ashmead family (the interruption which necessitates the "almost" in the above sentence was that for a short time it was used by Count Zinzendorf and his daughters as a Moravian school).

The old Town Hall of the borough of Germantown squats at Lafayette St. on an open green. It is a popular subject for painters and camera artists.

Most ancient stone house in Germantown stands where it was first built in 1690. During the Revolution it served as a hospital. Visitors learn that the British wounded were cared for on the second floor. Gen. Lafayette gave a public reception here in July, 1825. The location is Germantown Ave., south of West Walnut Lane.

Pastorius House, home of the founder of Germantown, is on the east side of Germantown Ave., north of High St.

Just above Herman St., on the east side of the avenue, may be seen another ancient church, the first of its sect in America. It was built by the later-numerous Mennonites in 1770.

Concord, or Old Ax Burying Ground, is also on the east side of the avenue, just above Washington Lane. Here are buried many soldiers of both the Revolutionary and British armies.

Billmeyer House, corner of German-

town Ave. and Upsal St. is significant because it was on the steps of this mansion that George Washington stood during the Battle of Germantown to direct the course of the fight.

Other old buildings on the avenue include the old Dunkard, or Brethren Church, first of this faith in America. In the present church building a large number of unbound copies of the now very rare edition of the Saur Bible were stored in the eighteenth century. These were seized by the British during the Revolution, and used for gun wadding, and as bedding for their horses.

### Progressive Philadelphia

Soaking up (and perhaps becoming supersaturated with) so much history might lead the speculative stranger to ask:

Has modern Philadelphia thumbed its nose at industry and progress and settled back on its 17th Century foundation, content to be known as "the cradle of American liberty" and several other impressively historic titles? Or has it used this same foundation upon which to erect a structure worthy of the traditions bequeathed it by its founder and the many illustrious men associated with the early history of the city?

A Philadelphia politician or Chamber of Commerce booster would probably answer that the citizens there are wise to the fact that not only must they keep pace with other great American cities, but that also they have the responsibility of maintaining a heritage which remains glorious only as the city shows itself a worthy trustee. And, if the flowers on such an oratorical sentence be unplanned and ashanned, the statement wouldn't be far wrong.

That Philadelphia shows little of the inertia to which tradition-bound cities are frequently susceptible is proved by the fact that it is the third-ranking American metropolis and the third-ranking production area in the country.

As any sales manager can tell you, it is a helluva good market—particularly for products for the home.

### Home Lovers

"City of Homes" is one of many sobriquets by which Philadelphia is recognized. (Having a flock of nicknames is usually a sign of adolescence; with senescent Philadelphia it merely indicates heterogeneity.)

There are a few more than 400,000 homes in Philadelphia—a conservative estimate, based on the actual home-owner census of 1932.

It is generally predicted that Philadelphia will continue to gain renown as a city of homes, inasmuch as there is ample space for expansion to the west and north in Pennsylvania and to the east in New Jersey, and—most important—the populace seems to have the garden-and-fireside instinct inbred.

In Philadelphia there are 9,238 buildings in which three or more families reside (last official count). Yet Philadelphia has more single-family dwellings than New York City and Boston put together, and more than the combinations of Cleveland and Detroit, St. Louis and Chicago.

Monofamily homes comprise fully 90 per cent of all Philadelphia dwellings. The home has first claim on the interests, and purse of the average Philadelphian.

Moreover, the suburban area contains newer homes than the city proper, and also has a greater (family-for-family) purchasing power.

Philadelphia was founded by conservative, home-loving people. It has remained—and likely will long stay—the city which its founders hoped it would be, in that respect. Residents, therefore, are always potential prospects for any product which will make living conditions more comfortable and enjoyable.

(To Be Concluded Next Week)

### Leave-Taker



Marge Albright of the Cramer-Krasselt Co., who has been recalled to Milwaukee after a sojourn in Detroit, thinks that it will be great to be home again.



E. Ebling of Sydney, Australia, called at the News' offices when he was in Detroit recently.



## Price & Conservative Habits Keep Canadian Sales Down Although Products and Selling Methods Match Those in U.S.

By Phil B. Redeker

While in Toronto attending the convention of the American Society of Heating & Ventilating Engineers the writer tried to get a line on some phases of the household electric refrigeration business in Canada.

While a comprehensive survey wasn't possible, between sessions of the convention we managed to contact a leading Canadian manufacturer and an active retail operation, the information obtained from these interviews being presented herewith.

### Hostess Has Own Unit, Automatic Defrosting

Principal Canadian-owned manufacturer of household electric refrigerators, from what we could determine, is Hostess Corp., which has its main offices and factory in Toronto.

G. C. Ward, Hostess sales manager, who has had considerable experience as a merchandiser in the United States as well as Canada, was a very busy man the afternoon we visited him, but with the courtesy typical of most Canadians he spent the afternoon discussing the refrigeration situation in Canada and showing us the plant.

"Our sales are running well ahead of last year, in fact we're behind on our orders," declared the Hostess sales manager. "However, don't be misled into thinking that this means we are doing an actual volume of business comparable to that done in the U. S. by some of the large companies, because the total volume over here is tiny compared with that done in the states."

#### 27,000 Units in 1934

According to Mr. Ward, total sales for all companies in Canada during 1934 was only 27,000 units, which indicates how comparatively small the household refrigeration business is across the border.

Chief barrier to a greater volume of sales, Mr. Ward believes, is the high price of the refrigerators and the fact that Canadian home-owners are more slow to adopt a relatively new development like a mechanical refrigerator in the home than their Yankee neighbors.

Although Hostess has been active in the refrigeration business only since 1933, its interest in refrigeration dates back as far as 1922, Mr. Ward explains.

#### Subsidiary of Large Firm

Hostess is a subsidiary of International Metal Industries, Ltd., which controls various types of manufacturing operations both in Canada and the U. S. Its principal products are gasoline pumps and other gasoline service station equipment. It claims to get 80 per cent of the total Canadian volume in the types of service station equipment it handles.

In the U. S., the chief subsidiaries are the John Wood Mfg. Co. of Chicago, Conshohocken, Pa., and Richmond Hill, N. Y. (hot water heaters, range boilers, coal stokers, fuel oil tanks, etc.); and Superior Metal Products Co. of St. Paul (milk and ice cream cans, and other equipment for the dairy industry).

#### Evaporator Designed in 1922

Back in 1922 an engineer for the parent company designed a refrigeration system with the same type of evaporator which is now the chief feature of the current Hostess models.

The engineer took his idea to the U. S., but it failed to interest U. S. manufacturers and engineers.

The parent company maintained its interest in the refrigeration field in a developmental way, but the volume of its business on other lines was growing so fast that not much thought was given to putting a refrigeration line on the market.

#### Line Brought Out in 1933

However, with its business slowed down after 1929, International Metal Industries, Ltd., again began to think more actively about refrigeration, and in 1933 was ready with its line.

As the outstanding feature of the Hostess system, we have previously mentioned the evaporator. It is through the construction of this evaporator (which is really two separate evaporators) that Hostess makes its claim for completely automatic defrosting.

A detailed, technical discussion of this evaporator and the method of defrosting will be published in a future issue of ELECTRIC REFRIGERATION NEWS.

#### Rotary Compressor Used

Refrigeration for the Hostess models is furnished by a compact, hermetically sealed rotary compressor, for which is claimed extreme quietness of operation.

"I don't believe that many people in the industry know we do prac-

tically all the manufacturing operations on our Hostess line of refrigerators," declared Mr. Ward while we were on an inspection tour of the plant.

"The motor, copper tubing, controls, and plug-in cord are about the only parts we don't make."

Not only has Hostess designed and built its own refrigeration system, it also designs and builds its own cabinets.

For a time Hostess was a licensee of Crosley on the Shelvador idea, and its cabinet style was very similar to Crosley's.

This year, however, Hostess is not operating under the Crosley license (although it has a food rack inside the door), and it has developed a very stylish cabinet of original design, most nearly resembling the G-E Flatop among its Yankee counterparts. —Unique is the employment of a grille effect around the base, this "grille work" being removable for cleaning purposes.

#### Service Agreement

On its four leading models Hostess offers a one-year guarantee and a two-year service warranty on the hermetically sealed mechanism. Under this agreement, the factory sends the replacement unit to the dealer postpaid, and receives the original unit carriage collect.

To protect itself against abuse of this warranty, a stipulation is put in the dealer's contract which makes it binding upon him to pay the manufacturer the sum of \$15 should the supposed defective unit work satisfactorily after any minor adjustments, tests, or repairs as outlined in the company's service manual.

### Novel Sales Ideas Boost Toronto Store's Sales

They merchandise electric refrigerators by methods that might seem a trifle strange to major retail stores in the U. S., but Simpson's, a leading department store here, is enjoying one of the best seasons in 10 years of refrigeration campaigning.

Sales in April and May were declared by store officials to show an increase of more than 100 per cent over the corresponding months in 1934.

One thing that makes Simpson's almost unique among department stores selling refrigerators is the fact that it is an "exclusive" dealer, handling Kelvinator household refrigerators only. The store has never handled anything but Kelvinators, says Thomas Dunn, buyer for the home appliances department.

#### Believes in 'Single Line' Idea

Mr. Dunn is a strong believer in the "single line" idea. He points out that a salesman can tell a lot better story if he can concentrate it on one appliance. The one line plan also eliminates such evils as favoring one make out of many, fear of forceful selling on a particular make, and other disadvantageous attributes of the setup whereby a number of makes are handled.

Toronto citizens who are members of Simpson's "Home Lovers" club can purchase a refrigerator costing \$200 or less for \$10 down, the balance payable in 10 months, "with no interest or carrying charges."

#### 'Home Lovers' Club

The "Home Lovers" club is one of Mr. Dunn's projects. Its success, of course, is based on a thorough knowledge of the credit rating of the particular prospect, and confidence in old customers.

"Other department stores scarce believe us when we tell them that our percentage of repossessions is at its highest not more than one-half of 1 per cent," declares Mr. Dunn.

Simpson's has a "refrigeration specialist" in the person of Harold King. Sent to Simpson's by Kelvinator, he oversees the floor selling and directs special campaigns.

#### Selling Started in February

For instance, one way in which he has beat the adverse weather this spring was to inaugurate a selling drive of no mean proportions in February, which is more or less jumping the season.

He made good with it, however, one of the chief reasons being that the salesmen started to go outside the store to follow-up leads.

The average Canadian, it seems, is not so receptive to some of the specialty selling methods employed by outside commission salesmen in the U. S. However, Mr. King worked out a plan for following up leads in the prospect's home, which was in

effect getting the prospect to practically issue an invitation.

#### Must Visit Users

Mr. King has also developed a plan for "using the user" to get prospects. "Every two weeks," he explains, "a salesman gets five cards, with the name of a user on each. It's the duty of the salesman to visit the user, get the serial number of his refrigerator, see if he's satisfied with the performance of the unit, and get the names of five prospects."

Making the salesman get the serial number of a unit is the "hooker" in the plan whereby it is made certain that he visits the user.

Simpson's sells Kelvinators on the Meter-Ator plan, in fact approximately 50 per cent of its refrigerator sales are now on the meter plan, say officials. There was a time, however, when many merchandisers didn't believe that the meter plan would ever be successful in Canada.

#### Views on Instalment Buying

Reason for this belief has its basis in the disposition of the Canadian people on the matter of buying things on time.

They apparently feel that to purchase an article on deferred payments lowers them in the eyes of their neighbors, and is a blow to their pride.

This is exemplified by the Simpson official's story of how the first refrigerators sold on the Meter-Ator plan had to be delivered at night—at the request of the purchaser!

An educational and advertising program has gradually broken down resistance to meter sales. Simpson's features meters and terms in its newspaper advertising, which is its chief promotional weapon.

Service on refrigerators sold by Simpson's is handled by Kelvinator of Canada, Ltd., the department store paying a flat charge on each unit to cover all service calls.

## Sales Idea of the Week

By V. E. Vining, Manager of Department Store Sales, Westinghouse Electric & Mfg. Co.

Why hesitate to talk mechanics to a woman?

She is General Manager, Office Boy, and Head Clerk in a complete manufacturing plant, which we call "Home"—equipped with more mechanical appliances and devices than we find in the average small factory.

Every day of her life she plays tunes on a hundred switches to get desired electrical results; she runs a washing machine, a vacuum cleaner, a refrigerator, an ironer, a dishwasher, an electric mixer, a radio, a thermostatically controlled cooking stove, heating plant, and water heater and still finds time to drive her own car, become a bridge expert, and correct her slice on Number One Tee.

She can fix with a hair pin and a rusty nail an appliance that her husband will work over for hours and then take it downtown in his overcoat pocket.

The average man can't even keep a cigarette lighter working.

Sure—mother lets father think he is "head mechanic"—he should occupy some official position in the home.

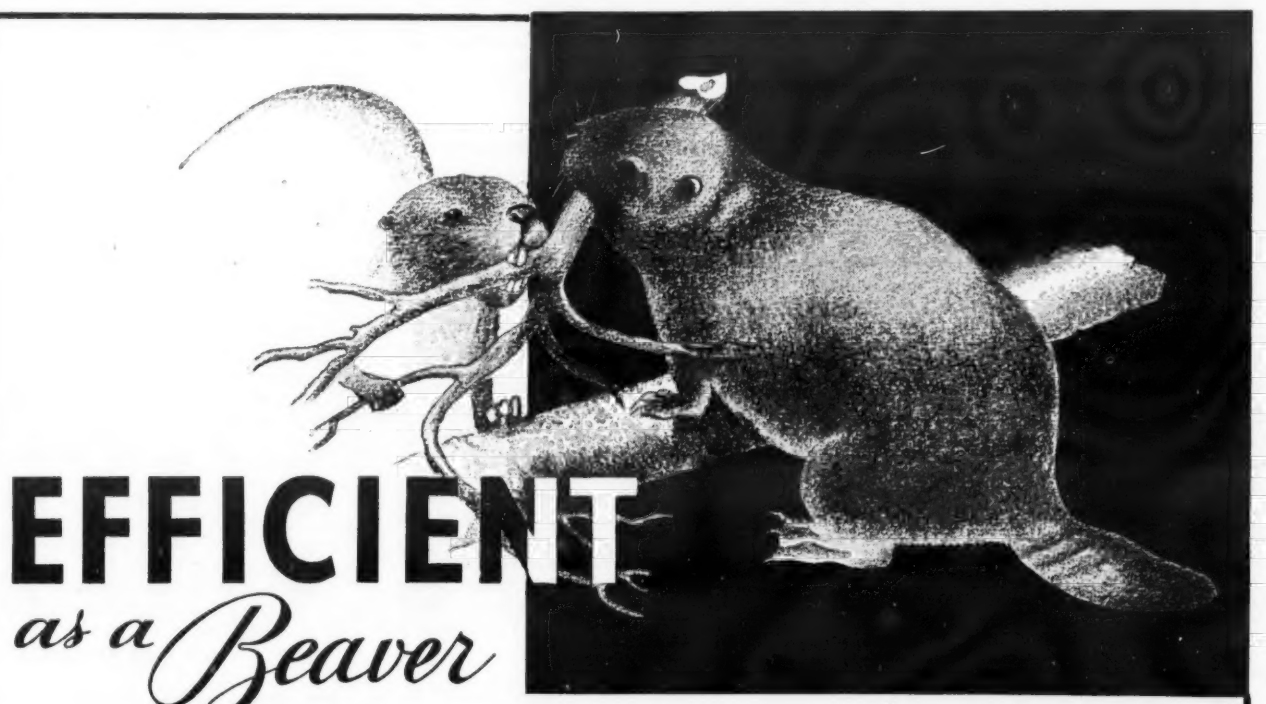
But—don't be fooled—

The woman is interested in our mechanical story, providing we tell a story—that is simple, interesting, and—has a point.

She will follow every step of the way.

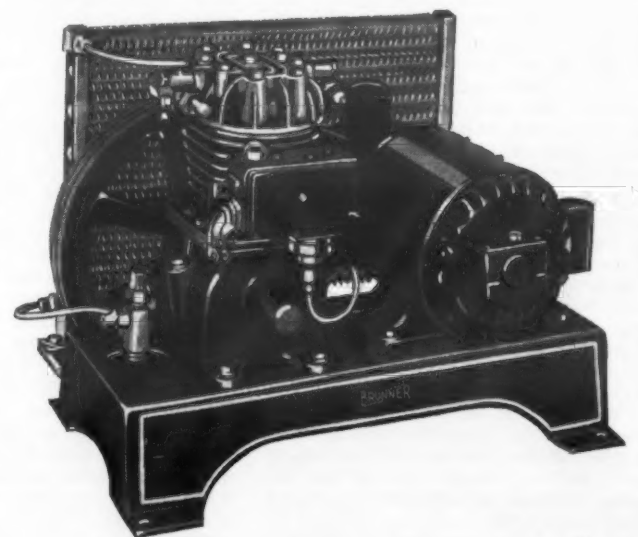
Save your technical terms for father. They impress him—tremendously.

But maybe he, too, might like to hear a story he can understand.



EFFICIENCY... not the kind that goes great guns for a short span and then burns out—but "long winded" efficiency. That's what you get from a Brunner refrigeration unit.

To Brunner, efficiency means a long record of service with minimum dollar input. See if we're not right! Specify Brunner Compressors and Brunner Highsides on your next design or installation. Watch results. It won't take long for these quiet, improved refrigeration units to demonstrate why Brunner is "the Fastest Growing Name in the Industry"... And remember: The Brunner line is complete—units ranging from 1/6 H.P. to 15 H.P., air and water cooled, for every refrigeration need. Write for interesting new catalog. Brunner Manufacturing Company, Utica, N. Y., U. S. A.



Brunner Display Case Model—Sturdy—Quiet—Economical. Two cylinders. Air or water cooled. One-quarter and one-third H. P.

# Brunner

A NAME BUILT BY 29 YEARS OF SERVICE



## Ruthenburg Urges Management To Adopt Program of Sound Relationship with Workers

By Louis Ruthenburg, President of Servel, Inc.\*

FOR the purpose of this discussion, the following statements may be accepted as self-evident facts:

1. Modern management recognizes distinct and special responsibility toward its stockholders, toward that sector of the public which is or which may become customers or clients, and toward the people on its payrolls.

2. Responsibilities toward the first and second groups cannot be effectively discharged unless responsibility toward the third group receives adequate attention.

Because of the pressing need for dealing with employee relationships comprehensively and adequately, we may profitably consider the more important aspects of the problem, review available data as to method of attack, and then determine whether an improved technique can be applied to our specific problems.

### The Current Problem

The basic problems involved in management—employee relationships are as old as the industrial era. In fact, many of them are much older. But pressure for solution of these problems varies with the current economic situation and the pressure becomes most acute after a protracted period of serious economic distress, when self-seeking politicians, badly balanced theorists and all manner of social reformers obtain receptive hearing and enthusiastic support from chronic malcontents, from the distressed masses and from those who have been led to believe that their future is in jeopardy.

From these groups the disturbance spreads until normally stable groups are disrupted and the atmosphere of discontent and unrest becomes well-nigh universal. Under such conditions, emotionalism tends to replace logical reaction. Today the speaking voice which has ever swayed emotions far beyond the power of the written word, goes forth from a single source to the eager ears of millions of listeners. None can predict the outcome. The art of propaganda as practiced by dictators, political administrations, demagogues and reformers has been perfected to a degree that sets at naught all previous standards as to probable effect. Enormous sums of money are available to proselytes of every description.

### Finance Injurious Schemes

Ironically enough, these funds come directly and indirectly from those most susceptible to injury from the attacks which they unwillingly finance.

Thus are the employees of American industry actively, consistently influenced to believe that the operations of American industrial management are inimical to their interests. Irresponsible agitators push our industrial employees constantly toward the conviction that their interests and those of their employers are not mutual but antagonistic, and that in third party affiliation alone lies their comfort and salvation.

Such hurtful propaganda is fostered and actively abetted not only by all manner of impractical reformers but by many holders of high political office, and by the partial and full time activity of thousands of government employees who are paid for such activity by wealth and credit created in a large part by American industrial management.

Inevitably such activity has had and is having far reaching effect. Encouraged by the backing of the law, and the sympathy of the administration, self-seeking proponents of third party representation have harassed management and workers alike, have fomented strikes without just cause, have caused the abandonment of industrial projects and have delayed the coming of economic recovery, thereby serving to defeat the dearest objective of the administration which has so short-sightedly upheld the interests of these self-anointed saviors of the social order.

The fact that current conditions are not far worse may reasonably be regarded as an indication of the essential common sense of the average American workman rather than as an indication that management has discovered and applied entirely adequate remedies.

In candor it must be admitted that, for all its pride in ability to sell its products, industrial management has not troubled to do a particularly effective job of selling itself to the people most likely to be affected by the sales talks so effectively broadcast by purveyors of social panaceas.

An inferior product well sold frequently is more successful than a superior product indifferently sold.

\*Address delivered at the recent annual convention of the National Metal Trades Association.

Agitators of all types are selling their product intelligently and intensively. Their sales efforts are supported by extensive advertising and publicity campaigns, national and local.

Regardless of the fundamental merit of their goods, they are finding many buyers, and so far, they have not had to contend with intelligent competition on the part of industrial management.

If industrial disturbances bordering on chaos are to be avoided, management must compete intelligently and aggressively for the support and loyalty of our workmen. That which management has to sell our workmen has superior merit and management should have superior selling ability.

But until management recognizes the fact that it has a real big league selling contest on its hands and devotes to this problem the same ingenuity and skill and energy that it normally devotes to selling its physical products, competition will prevail and the people on your payroll, hearing only your competitors' sales talk, will believe either that you have nothing to sell or that the competitive product is superior.

### Development of a Program

If management recognizes its responsibility to stockholders and to the public, and realizes that the discharge of these responsibilities depends very directly upon how well management deals with the people on the payroll, it follows logically that management should develop and execute an effective program to establish for the present and to insure for the future, the soundest relationship attainable between management and the working force.

### Fundamental Considerations

The primary objective of such a program must be to prevent the infection of the working force by doctrines harmful to the working force and to the stability of the business.

There are two well known methods for preventing infection. One is segregation—the other is immunization. But when infection is broadcast so generally and effectively as is now the case, segregation becomes impractical and efforts must be directed toward immunizing the working force against infection.

Fortunately the average American workman responds readily to such treatment, particularly if infection has not taken place or if its ravages are not too far advanced. The test for immunization is deliberate and controlled exposure to infection. Such tests have been made in this matter of industrial relationships.

### Organizers Give Up

Some years ago, after an intensive campaign of selling managerial policies to the working force, a well-known manufacturing organization deliberately hired several union organizers and watched the effect of their attempts to infect the working force. The organizers made no progress whatsoever and soon quit—completely discouraged.

Their comments—"you can't induce men to pay union dues when they are convinced that they are getting a square deal from the management and when they have no grievances."

Coming from such a source, this statement may be regarded as an authoritative one. If it can be accepted as the theme for a program for establishing sound relationships between management and the working force, and if that campaign is carried forward in such manner as to bring about the successful outcome of such a test as the one just described, there can be no question about the success of the enterprise.

Effort must be directed toward convincing our people that their interests and those of management are not antagonistic but mutual; that they have more to gain, in the last analysis, by working in partnership with management than by forming third party affiliations and depending upon the intrusion of self-seeking outsiders who have little understanding of and no sympathy with the mutual problems of your management and your people.

The average American workman has sufficient intelligence and experience to understand that higher wages and shorter hours will avail but little if they result in increasing costs to a degree that puts his employer out of competition or discourages buying and wrecks the business. He has a common interest with management in insuring the future stability of the business.

The theme of partnership and mutual interest must be stressed constantly and effectively. Partners may quarrel between themselves but

usually they resent third party interference.

### Review of Policies

No amount of ingenuity applied to a selling job will have maximum effectiveness unless the product to be sold is capable of giving lasting satisfaction. It is just possible that some of our policies which affect employee relationships are such as to make some of our people skeptical of our sales talk. It is vitally important that we deliver the goods and that the goods shall support our claims. Consistent and candid review and possible revision of policies will therefore be in order.

As we examine our policies we must recognize a few simple principles. Emotions—the way people feel—are of first importance. You may have the finest and most equitable policies imaginable, but if your people feel that they are otherwise, the fact will be of no practical importance.

The way the job is done is much more important than what is done. The spirit in which the undertaking is approached and carried through is of far greater importance than the particular form the project assumes.

### Earnings Considered First

In examining your policies, it is well to begin with those which affect the purse, remembering that annual, monthly and weekly earnings are far more important than the hourly rate.

How do such earnings compare with those paid by other firms in your community?

How do your people feel about your methods of wage payment?

Are these methods such that the most ignorant workman in your plant can at all times accurately check the calculation by which his earnings are computed?

Do any of your workmen feel that they are inconsequential parts of large earning groups in which individual effort is of relatively small importance?

Do your workmen feel that piece work prices are properly guaranteed or do they feel that high earnings will result in price cuts?

What of lost time which affects weekly, monthly, and annual wages? Has everything possible been done with material control, maintenance of equipment, reduction of seasonal fluctuations to insure continuity of employment?

### Reward for Better Work

What is your policy with respect to scrap and rework? Do your people feel that they are unfairly penalized?

Are your people convinced that they can obtain permanent wage increase by increasing their productive efficiency or do they stop short of their best effort for fear that increasing the pace will result in ultimate advantage to the company only?

What of shop conditions with respect to safety and sanitation?

Are provisions for recreation and social activity adequate?

What educational facilities do you provide for your employees to the end that people may be better qualified for their present jobs and for promotions?

Are your people provided with a fair and impartial court of appeal from decisions which they feel to be unfair? Can they appeal to this court without fear of reprisal?

Do you have a works council? How are its members elected? Did your works council develop its own constitution and by-laws without interference by the management? Does every officer of the company hold himself in readiness to meet with the council at its invitation and to discuss pertinent matters candidly and in as much detail as may be desired by the council?

Next, it is well to think in terms of how your people feel about their immediate supervision. Have your group leaders, straw bosses, assistant foremen, foremen, superintendents, and rate setters been carefully and systematically trained in the intricate art of dealing with men in such manner that they will feel that they are receiving a square deal?

The foregoing questions are only suggestive and do not by any means cover the entire range that must be canvassed in order to establish sound and salable policies of employee relationships. Candid appraisal of such matters of policy may disclose desirable changes.

### The Selling Plan

If the number of employees is not too great and the general manager has the necessary qualifications, direct selling may be given favorable consideration.

I know a very successful organization employing about four hundred people, in which the general manager meets monthly with all employees of his organization in an open forum. This plan has much to commend it. Misunderstandings, suspicion, and delays are minimized. Every employee feels that he has direct access to the management. The manager at all times knows the exact sentiment of his people.

This plan cannot be followed with maximum effectiveness unless the manager has good qualifications for

dealing with large groups of people. Moreover the effectiveness of such a plan may be lost if those intermediaries—superintendent, foremen, assistant foremen and group leaders and rate setters, who are in more constant and intimate contact with the working force than the general manager, are not well trained in the art of constructively dealing with the winning forces.

Under such a plan, the general manager must at all times avoid the danger of weakening the authority or assuming the responsibilities that should be vested in those same intermediaries.

In larger organizations the direct selling plan is, for obvious reasons, impractical and the work must be delegated, in large part, to the supervisory force and to the works council.

### Training the Sales Force

Bearing in mind the fact that the most effective selling will result from the adoption and constant and consistent practice of sound policies, the importance of effective education of the supervisory force and of the works council will be recognized as an undertaking of the greatest importance. Your people are not mind-readers.

Your policies and your reasons for adopting such policies must be thoroughly understood by every individual who represents, supervises, or influences the people on your payroll, and these people must be trained to transmit to your employees without distortion.

The educational problem is not one that will be easily solved. It requires the adoption of a sound philosophy, careful planning and the utmost patience and persistence in execution.

### Supplementary Activities

The selling campaign must be regarded as a continuous, never ending activity. When selling and advertising activity cease, or diminish, people do not continue to buy.

The major and most effective activities always will be those which have previously been outlined. But just as any major selling effort is made more effective by contemporary advertising and promotional activity, we shall find it worthwhile to explore every possible channel through which people may be influenced to adopt a constructive and cooperative attitude.

A factory newspaper which is published weekly, bi-weekly, or monthly, can be made a splendid instrument for creating a sense of solidarity and esprit de corps.

An autonomous organization of employees for organizing and supervising sports, recreation, and social activities frequently is most helpful. Annual picnics and balls sponsored by such organizations soon become institutions of value in the general scheme under discussion.

An educational program which will help people to increase their earning capacity by becoming more proficient may be made to serve many useful purposes.

Constructive handling of group insurance, first aid activities and sick benefits should receive the active attention of management.

Too frequently such activities as those last described are not organized and correlated to the central theme of selling constructive ideas to the working force. Selling cannot be done too aggressively through such agencies. Here suggestion and the practice of fair play will be more effective than forceful sales tactics.

American industry must make rapid progress in this matter of industrial relationships. This may be accomplished steadily, constructively, and without disruption of industrial activity if management will quickly adopt constructive measures.

If management fails to effect rapid progress, the imposition of drastic and impractical schemes which must be tried before error is manifest—schemes which will seriously disrupt industrial activity, delay economic recovery and sadly delay constructive progress—is inevitable.

## May & Young Join G-E Radio Dept.

CLEVELAND—D. W. May and H. E. "Herb" Young—two sales executives well known to the refrigeration industry—recently joined the radio division of the General Electric Co., where they will assume duties in launching the new line of General Electric radio.

Mr. May has been appointed New York special representative for the line. He formerly distributed Crosley, Majestic, and Philco products. Two years ago the May Radio & Television Corp. was liquidated and Mr. May went into refrigerator and radio manufacture in Newark, N. J., forming the May Radio & Refrigeration Corp.

Mr. Young, now special representative for G-E radio in Philadelphia, Baltimore, and Washington territories, entered the radio industry with the old Music Master Corp. as New England sales manager.

In 1924, he became eastern sales manager of the Grigsby-Grunow Co., then manufacturer of a battery eliminator. When the Chicago concern of Grigsby-Grunow went into radio set manufacture, Mr. Young became general sales manager and later vice president in charge of sales for that concern.

He was with the Grunow Corp., predecessor of the General Household Utilities Co., for a year prior to becoming eastern sales manager for the Gibson Electric Refrigerator Co. During the past 10 months he has been eastern sales manager of the General Household Utilities Co.

## Two Slide Films Are Released by G-E

CLEVELAND—The first two 1935 slide films for use by General Electric salesmen in selling to customers have been released. The two films are titled "G-E Defies Time and the Elements" and is a Monitor Top refrigerator subject; and "The Inside Story of the Flatop Refrigerator."

"For several years we have made available to salesmen the slide film service and the small pocket-size projector for use in 'showing' our story to the prospect," states Ralph Cameron, manager of the department store division. "Now, more and more department stores are using this silent slide film service, both in the store and in the homes of prospects."

"The slide film, which can be shown on the wall of store or home, still is a novel means of interesting the prospect. It tells a convincing story and grips the prospects' attention."

## New G-E Store Opened In Asheville, N. C.

ASHEVILLE, N. C.—The All-Electric Co., a new firm carrying General Electric supplies and appliances, was opened here recently, reports J. F. Wallas, dealer.

The new store is managed by J. F. Wallas and the sales manager is S. C. Penland, formerly manager of the electric department of Sears, Roebuck & Co. here.

L. W. Driscoll, Charlotte, N. C., G-E distributor for North Carolina, attended the formal opening of the new store.

## Goldstein Reports Gain In Sales to Dealers

CINCINNATI—Harold W. Goldstein, president of the Anchor Lite Appliance Co., Crosley distributor in Pittsburgh, while recently visiting the Crosley factory here, stated that sales of Crosley Shelvador electric refrigerators for the first five months of 1935 were 66 per cent more than the average monthly quota for the corresponding months in 1934.

## Bruce Palmer Looks, Lights, Leaves



The candid camera catches busy Bruce Palmer of Bush Mfg. Co. on a recent visit to the News' new home. (1) "I can't stay long—the fanned coil business is the best it's been in months." (2) Ready to leave for another appointment. The fast lens catches the match's flare as Mr. Palmer lights up.



## AIR CONDITIONING

### Servel Conditions Air In Wholesale House

KANSAS CITY—Customers who call upon the William Volker Co. of this city during hot summer days will find themselves in a clean, refreshing atmosphere as a result of the recent installation of Servel air-conditioning equipment.

Servel equipment serves the general offices and five wholesale sales rooms on the first and second floors of the six-story building. G. N. Paris, sales engineer for Midwest-Grunow, Inc., Kansas City distributor for Servel commercial and air-conditioning products, supervised the installation work.

The equipment consists of two 10-ton Servel machine units, both installed in the basement of the building, connected in multiple to six heavy-duty suspended-type cooling units. Each of the five sales rooms is equipped with a Servel unit hung from the ceiling, and another has been placed in the general offices. All have been arranged to properly assist each other in the circulation of air throughout the conditioned space.

The sales rooms measure 35x135 ft., two of which are located on the first floor and three on the second floor. The building occupied by the William Volker Co., wholesaler of furniture, floor coverings, draperies, covers the entire block between Second and Third streets on Main street.

### York Cools Hershey's Windowless Office

(Concluded from Page 1, Column 2)

cu. ft. per minute. Circulation will be regulated by pneumatically operated control equipment.

The air-conditioning equipment serving the second floor will be located adjacent to the water-cooling equipment, and from this point conditioned air will be distributed to furred spaces over the hallway on the second floor.

Sheet metal ducts above the ceiling will conduct the air to the various rooms along the hall. Air will be returned to the system for reconditioning through grilles in the office doors.

Located in the pent house on the roof will be the system which conditions the air of the third floor. Insulated supply pipes will traverse the roof, distributing the air into the ceiling plaques, located in the conditioned areas. Air will be returned through grilles, located at the floor line on the west side of the building. Enough conditioned outside air is introduced to provide a minimum of 15 cu. ft. of air per person per minute. The air within the rooms will be completely changed by the system every eight minutes.

**Low Cost Product Cooling**

Whatever your product cooling problem, send us your letterhead and complete detailed information on the new TRANE Product Cooler will be sent to you immediately.

The TRANE Product Cooler is the most recent development of the famous TRANE Line. It is for use in storage rooms of all kinds where meats, vegetables, dairy products, malts, furs, and other perishables must be stored. It also has a wide application for refrigerating trucks.

The Unit is compact, easily installed, and easily moved.

Your letterhead will also bring you complete information on TRANE Products such as complete Air Conditioning Equipment, Direct Expansion Coils, Unit Heaters, Unit Coolers, Convection Heaters.

**TRANE  
PRODUCT  
COOLERS**

**THE TRANE COMPANY**  
LA CROSSE, WISCONSIN

### Permanent Exhibit of Conditioners Built By Ohio Edison

By H. E. Sutton, Electric Sales, Ohio Edison Co., Youngstown Division

EVEN dealers, representing American Blower, Carrier, Frigidaire, General Electric, Kelvinator, Westinghouse, and York air-conditioning manufacturers, united with the Ohio Edison Co. in Youngstown, Ohio, recently to put on an air-conditioning exhibit in the auditorium of the power company.

A story has been built around this air-conditioning equipment, with the view to establishing in the minds of the people who visit this exhibit, a more substantial knowledge of how air conditioning can be used in the home, office, or plant. Since about 85 per cent of all sales are made through the eye, we have attempted to appeal primarily to this medium.

We want to bring out that the use of air conditioning on a year 'round basis holds no mystery, nor is it too technical or even high priced to be beyond the comprehension of these people who view our exhibit. Air conditioning is ready for the market to improve the condition of the air within any room, regardless of building construction.

#### Fountain Has Lighted Bottom

In the center of the auditorium we have constructed a fountain, which carries a story of air conditioning for health, comfort, efficiency, and profit. This story is placed on glass plates under water, with lighting beneath a false bottom of the tank. The copy on the glass stands out in an appealing manner as the fountain sprays water down over the rocks to ripple the surface of the water over the glass plates.

The story is further developed through the use of a short skit in which six characters appear, three of whom are villains known as "High Temperature," "Humidity," and "Dust and Dirt." Their ability to work on a customer in a restaurant about 6 o'clock in the evening of a hot summer day is quite familiar to all of us. Needless to say that the air-conditioning unit, which the restaurant manager obtains just in time to hold his customer, saved the day. This unit produces such a change in the customer that he orders a steak with all the trimmings, and not only one but three, as he leaves to telephone two of his friends to have dinner with him in a real place.

Easel type placards portray graphically the pertinent stories of the value of and need for air conditioning. We have attempted to make it impossible for the prospect to leave the auditorium without being thoroughly air-conditioning minded.

#### Change of Cycle Visualized

Perhaps the most important idea of our educational effort is to appeal to the mind of the individual who views a large bulletin board, which explains how true air conditioning is accomplished by providing better air to breathe and controlling temperature, humidity, purity, circulation, and ventilation within an enclosure.

In the upper right hand corner of this board there appears a picture of a room into which one looks as if from the ceiling, showing the walls, furniture and two occupants. We explain how air which conditions this room passes through ducts and is filtered, removing dust, dirt, and pollen, and then passes over the cooling coil where it is cooled and dehumidified and is then circulated about in the room.

An exhaust fan removes the smoke and odors from the room. The air is then re-circulated and outside air is added to compensate for the loss. This step completes the cycle.

#### Shows How It's Done

In order that the heating cycle may be shown on the same board we have designed a method using two stereopticon lanterns focused on a mirrored plate glass, in order to save space, and hence transferred to a ground glass surface, which picture appears on the front of the board.

These pictures change every 30 seconds unless held for further explanation. Coincident with the change of picture on the ground glass from cooling to heating cycle there is a change of copy from condensing unit to boiler and a change of color of the arrows in the duct from green to red, indicating the temperature of the air within.

Our appeal in the presentation of this exhibit has been to groups, the first of which were executives of the Republic Steel Corp., and the Youngstown Sheet and Tube Co. from an

## Making Air Conditioning Understandable to Prospects



In the auditorium of the Ohio Edison Co. in Youngstown is this educational exhibit on air conditioning, sponsored by local dealers and the utility. In the foreground is a fountain, on the bottom of which is printed the story of air conditioning's benefits. The man in the rear points to a huge chart by which the operation and functions of the air-conditioning cycle is explained in simple terms.

educational standpoint to acquaint them with the subject of air conditioning. We also wanted to point out the potential outlet for steel with sheets and angles being used for duct construction as well as sheets which go into cabinet design.

This new industry, air conditioning, will take up the excess capacity of the new continuous mills and this will materially benefit this community.

These groups were followed by groups of attorneys, physicians, dentists, merchants, and other prominent, well-known prospective purchasers, by invitation. In all cases we have invited these people to be our guests at a luncheon and have told the story in the limited space of one hour, including luncheon, short skit and explanation of the board and bulletins, and an opportunity to meet and ask questions of the various dealers' representatives, who are present at the show.

We found this to be extremely profitable from the standpoint of awakening the people in the City of Youngstown to the fact that air conditioning is non-technical, non-mystifying, and not too expensive to be within their reach when they consider the effect of air conditioning from the standpoint of health, comfort, profit, and prestige.

### Experiments Demonstrate How Conditioners Help Hay Fever Patients

CHICAGO—Complete relief of symptoms of hay fever produced by ragweed pollen will occur in a half to one and a half hours if pollen is removed from the air by filtration, a report of research made on the subject by Tell Nelson, M.D., B. Z. Rappaport, M.D., and William H. Welker, Ph. D., departments of medicine and physiological chemistry, University of Illinois, College of Medicine, states.

The air-filtered room is in no sense a cure for hay fever, but merely removes the irritating factor, says the report. Symptoms will reappear rapidly when pollen-laden air re-enters, they state.

By means of filtration, these three men were able to remove over 99 per cent of the pollen. Apparatus used was made by the American Air Filter Co. of Louisville, Ky. Factors to be considered in the removal of pollen, say the research workers, are as follows: air must pass through the filters at a low velocity, and no vibration must be transmitted from the blower to the filters. A large area of filter surface is needed to meet these conditions.

To reduce the space requirements for the apparatus the American Air Filter Co. designed a fluted filter which gives a large filtering area with a comparatively small space requirement for the installation. To accomplish a high degree of pollen removal, a second series of filters were used, so that in effect, the air passes twice through the filter material.

In pollen asthma most patients responded to the filtered air form of treatment, but the time required for relief of symptoms was much longer (one to seven days or longer depending upon the severity of the symptoms) than in the case of hay fever.

In pollen asthma cases, as in hay fever cases, symptoms rapidly reappear when the patient becomes exposed to pollen.

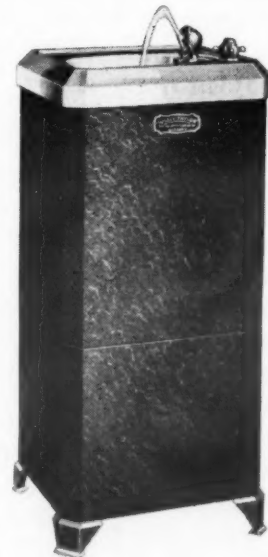
In the course of their investigations, these men found that following a heavy thunderstorm pollen asthmatic patients, who were free from symptoms, developed severe asthmatic attacks. Since these attacks could not be attributed to pollen, the experimenters attempted to discover what factors played a role in the onset of these attacks.

In cooperation with the People's

Gas Light & Coke Co. of Chicago, a dehydrating apparatus was installed in order to study the effect of controlled low relative humidity and constant temperature in conjunction with the filtration for removal of pollen from the environment of pollen asthmatics.

Results of this test showed that the onset of the asthmatic attacks under these conditions were delayed; that recovery from the attack was speeded up; and that possibly the degree of severity of the attack was mitigated.

**A Cooler with a Record**



**10  
Distinctive Models**

Capacities from 3½ to 14 gallons

Cabinets in smart olive-green baked crinkle finish

for  
**DEPENDABILITY**

● Halsey Taylor Electric Water Coolers have served the Government in many of its buildings as well as the largest industrial plants throughout the country, to say nothing of business offices everywhere... with a record of complete satisfaction and trouble-proof service!

for  
**SALES APPEAL**

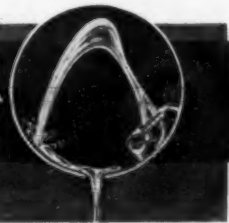
● Halsey Taylor Coolers are mechanically efficient, easy to install, require minimum servicing, and have extra sales advantages. No other cooler has the Halsey Taylor two-stream projector, which assures hygienic drinking mound at uniform height... the same sanitary projector as is found in Halsey Taylor drinking fountains in all prominent skyscrapers, hospitals, schools, etc. Yet your customer pays nothing extra for this extra sales appeal!

for  
**READY PROFIT**

● Our liberal dealers' proposition guarantees you substantial profit. You are sure of customer satisfaction, why not cash in on this fast-selling cooler at once, now at the height of the season? Limited territory still open. Write, phone or wire collect.

The Halsey W. Taylor Co., Warren, Ohio  
Manufacturers of Nationally-Known Halsey Taylor Drinking Fountains

**HALSEY TAYLOR**  
Electric WATER COOLERS





## ELECTRIC REFRIGERATION NEWS

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## Throat-Cutters

DEPRESSION days brought a new bogey-man to plague the electric refrigeration industry: the Chiseler. Originally this bad man was the dealer who would out the price on a refrigerator to take the business away from a dealer for the same make, after the other dealer had laid all the groundwork for the sale. Last year it was said that this reprehensible practice had almost disappeared. In recent weeks, however, reports have it that the Chiseler has reappeared upon the scene.

To the ranks of the Chiselers, moreover, another bad actor has been added this spring: the Throat-Cutter. Under this classification can be listed all dealers and salesmen who hurt their own business and damage the good name of the industry by casting aspersions on competitive brands and manufacturers of refrigerators. Of course, this type of dealer and salesman has always been present; but it appeared, for a time, that the industry was outgrowing its silly stage. Recently, however, the Throat-Cutting game seems to have become popular again.

### Two Current Examples

One of the best (or worst!) examples of current Throat-Cutting practice is the competitive use of a recent Consumers Research bulletin. Only a year or so ago almost everybody in the industry was roundly condemning the Consumers Research racket; and ELECTRIC REFRIGERATION NEWS took pains to point out some of the inaccurate and absurd features of this "service." This spring, however, Mr. Schlink et al put out a bulletin giving their comparative test figures on the operation of various refrigerator models on the market. Some makes, it was indicated, are "pretty good;" others were obviously gyps—according to the bulletin. As a result, salesmen for the makes which were tacitly approved by Consumers Research have been showing photostats of the bulletin to prospects in order to confute and ruin the presentations of salesmen for the makes whose performance was attacked by the Washington (New Jersey) publishers.

Here is another sample of Throat-Cutting: When revised specifications of household refrigerators were published in the June 12 issue of ELECTRIC REFRIGERATION NEWS, through an error at the factory the Norge prices were listed as "suggested zone 1" instead of "f.o.b. factory." Immediately, we are informed, competitors in such zone 1 cities as Chicago and Pittsburgh took this issue of the paper around to prospects, and asserted that Norge dealers in those cities were unduly jacking up prices. When these dealers had added the freight differential to the f.o.b. price, naturally it was a few dollars higher per box.

The NEWS has long maintained editorially that knocking a competitor is no way to sell refrigerators. When every salesman is going around casting aspersions on other makes—and

there are few prospects these days who are not visited by representatives of several different brands—possible customers lose faith in all electric refrigerators, and may end up by buying a new ice refrigerator.

### They Don't Sell Refrigerators

Yet it has been brought to our attention repeatedly that salesmen pounce on scraps of information in this trade paper, remove them from their original setting and atmosphere, and use them to damage the efforts of rival salesmen. Just as it is said that "you can prove anything by the Bible" so it has come to pass that salesmen for the Maybecold refrigerator are using the NEWS to substantiate their contention that the Notsohot refrigerator is a dud, while Notsohot salesmen are doing the same thing to blight the Maybecold reputation. Thus their arguments tend to cancel out; and although each accomplishes his purpose (i.e., prevents the rival from making a sale), neither sells the prospect a refrigerator.

On the front page of this issue of ELECTRIC REFRIGERATION NEWS, it is reported that almost one million household electric refrigerators were sold during the first six months of 1935 to distributors and dealers. That, of course, is easily a new record for half a year's business in this industry. Yet it is said that sales from dealer to consumer during this time have not been comparable. Field stocks are considered relatively high.

### Why Stocks Are High

Various reasons for this state of affairs have been assigned: (1) The weather has been unfavorable; (2) Chain stores run by the mail-order houses have taken too much business by virtue of low prices; (3) Manufacturers have established too many dealer outlets, and instead of using surplus dealers simply as display outlets, have stocked them heavily and encouraged them to sell aggressively—thus opening the door for the Chiselers. All of these factors may have some bearing on the situation; but we are inclined to believe that the Throat-Cutter is probably responsible for a substantial share of the damage.

In analyzing the problem which now confronts the industry, we suggest that serious attention be given to ways and means of discouraging the pernicious practice of Throat Cutting. And while the master minds of the industry are developing an antidote for this poison we urge that dealers and salesmen everywhere resolve to rid themselves of such a suicidal habit. Let the other fellow continue his dirty talk if he wants to, but don't be a sucker and think that you must do the same. People don't believe everything they hear these days—they would be raving maniacs if they did.

### Barber Shop Philosophy

Remember that people want electric refrigerators, therefore they want to hear good things about electric refrigerators. Anyone who tells them otherwise is simply a bearer of unwelcome news and, as such, is naturally suspected and disliked. If you have never considered this homely philosophy (and sound psychology) then try to figure out why it is that a bald-headed barber can sell hair tonic.

The man who makes a good living by selling refrigerators is the man who spends the valuable time granted to him by a prospect in explaining the merits of his product and the service it will render to the user. The man who wastes an interview by "running down" competitive makes will soon talk himself out of so many sales that he can no longer make a living in the refrigeration business. In the meantime, he has damaged the reputation and destroyed good will of the entire industry—including the dealer, distributor, and manufacturer whom he has been representing. The sooner such potential failures are discovered and weeded out, the quicker and surer the electric refrigeration industry will be of making an all-time sales record to consumers in 1935—and of building a lasting name for fair-dealing, honest service, and products of genuine merit.

## LETTERS

### A New Baby to Nurse

Ohio Edison Electric Shop Co.  
Youngstown, Ohio

Editor:

It has been quite some time since I last wrote to you but you will find enclosed \$3 for the renewal of my subscription to ELECTRIC REFRIGERATION NEWS. This seems to be a chain letter subscription for it has now been about eight years that this subscription has been going on.

Eight long years ago I first read the NEWS and it has certainly been a great help and a guide in this industry and as long as I am connected with refrigeration I expect to read it.

As you know, I pioneered the selling of household refrigerators when the old five and one-tenth cubic foot refrigerator was selling for seven or eight hundred dollars and we didn't wonder whether it would be quiet or not, we wondered if it would make ice and run. Things have certainly changed from the good old days.

I then pioneered commercial refrigeration, starting about five years ago and many improvements have been made in this line of business. Just recently I have started selling air conditioning which looks as if it's the new baby to nurse.

At present I am commercial refrigeration sales manager for the Ohio Edison Electric Shop in Youngstown in charge of commercial refrigeration and air conditioning. I already have a good start, in the last two weeks I closed six air-conditioning orders.

I finally closed a 5-ton order one morning and not being satisfied, I closed another 5-ton order that afternoon. I got a 10 ton, another 5 ton, a 3 ton, and a 1 ton job within a two weeks period and this certainly is a record for me.

I hope that you may sometime pay me a visit in Youngstown and I assure you that I will stop in if I am ever in Detroit.

CARL W. WINDEL,  
Commercial Sales Manager.

### For Subscribers Only

Western Union

Editor:

We consider your editorial in June 19 issue very fair and a compliment to ice industry. Also we pledge our cooperation. May we reproduce the editorial in full in mimeographed form, giving you due credit, for distribution to our employees.

CALIFORNIA CONSUMERS CO.,  
230 West Jefferson Blvd.  
Los Angeles.

Answer: For a number of reasons, we have objections to the reprinting of this editorial in other publications and consider it advisable to refuse all requests for permission to reprint this copyrighted article.

In brief, one of the difficulties about the publication of frank discussions of this sort is that reprints or extracts are not presented in the same atmosphere as the original. This difference in setting frequently results in entirely different reactions on the part of readers.

You will understand that ELECTRIC REFRIGERATION NEWS is edited for the benefit of a certain group of readers and that there are good reasons for limiting the distribution of such an editorial to such readers. While ELECTRIC REFRIGERATION NEWS is not considered a "confidential" publication and while we know that it is read by a great many people outside of the industry, we still feel that it is better to limit the circulation of such editorials as far as possible to those who have shown sufficient interest in the problems of this industry to subscribe to the paper.

### Excellent Typography

International Business Machines Corp.  
Tabulating Machine Division  
270 Broadway, New York City

Publisher:

I have just finished reading the June 12 issue of ELECTRIC REFRIGERATION NEWS, which was the first one received on my recent subscription, which was entered by our Detroit office.

You and your organization are to be congratulated for the excellent manner in which this paper is prepared. Its makeup and typography are of the finest, and I am sure the news items are eagerly awaited by everyone interested in the refrigeration industry. I was particularly interested in the article written by Mr. Thomas Evans, chairman, Refrigeration Division, Nema.

I am passing this paper on to the other executives of our organization, as I am sure they will find ideas in it that will be of interest to them.

I also want to take this opportunity of assuring you that the pleasant relationship that has developed between your company and ours is greatly appreciated.

ROY STEPHENS,  
Director of Sales Promotion.

## Life of a Refrigerator

National Electrical Manufacturers Association  
155 East 44th Street  
New York

Editor:

In connection with setting up its financing plan, the Rural Electrification Committee has asked us for information as to the useful life of certain appliances. Among these is the electric refrigerator and we should appreciate your providing us with an average figure that we can pass on to the Administration.

If the factors of obsolescence and trade-ins have any definite bearing on the subject, please qualify your estimate as much as you think it necessary.

In presenting this figure to the Administration no individual company or other names will be mentioned.

O. C. SMALL.

Answer: This is a subject concerning which we have very little information because of the fact there is no system of periodic registration for refrigerators or other appliances.

Some time ago several of the leading manufacturers were asked this same question but no definite answers were received. General Electric, Frigidaire, and Kelvinator replied that they could not even make an accurate guess as to the life of a household refrigerator. Westinghouse made a rough estimate of between 10 and 20 years and Norge called attention to their Marathon unit which has been running night and day for 8½ years.

For our own calculations we have arbitrarily taken the average useful life as 10 years. There are several factors to be considered in estimating the figure of average life including such items as obsolescence due to increased operating costs in later years, excessive service charges and, of recent years, the style factor.

In the case of automobiles where periodic registration is required it has been found that the average useful life of the car is approximately 7½ years. Similar life periods have been determined for other lines of merchandise where the life history could readily be traced, but to date no such figure has been obtained for household electric refrigerators.

### Coldspot Weights

The Cope Electric Company  
Light and Power Wiring  
Supplies and Appliances  
16 South Arch Ave.  
Alliance, Ohio

Editor:

In your issue of June 12 in the specifications of the Coldspot refrigerator, we note the net weight of the boxes has greatly increased over the specifications issued in your March 20 issue.

Will you please explain this great increase in weight of the various boxes?

F. H. RUCH.

Answer: After household electric refrigerator specifications were published for the first time this year in the March 20 issue, we received a letter from Sears, Roebuck stating that the weights for its refrigerators as given in this issue were incorrect. This letter correcting weights of the Coldspot models was published on page 4 of the April 24 issue and these corrected weights were the ones that were published in the June 12 issue.

### Air-Conditioning Show

Ohio Edison Company  
Youngstown Division  
Youngstown, Ohio

Editor:

In the April 24 issue of the ELECTRIC REFRIGERATION NEWS there appeared an editorial containing a letter written by myself, in which two questions concerning the staging of an air-conditioning show were asked.

Of course, you realize that at that time I was extremely interested in developing an air-conditioning display and seeking all the information that could be obtained to make this display the most valuable for the particular need.

We have since opened our show and have had some 400 prominent business, professional, and industrial men in seven different luncheons, and told them the story of air conditioning in such a way that very noticeable results have already been obtained.

I thought you might be interested in the attached article and pictures telling more of this exhibit to the end that you might be better able to answer questions along this line that may come to your attention.

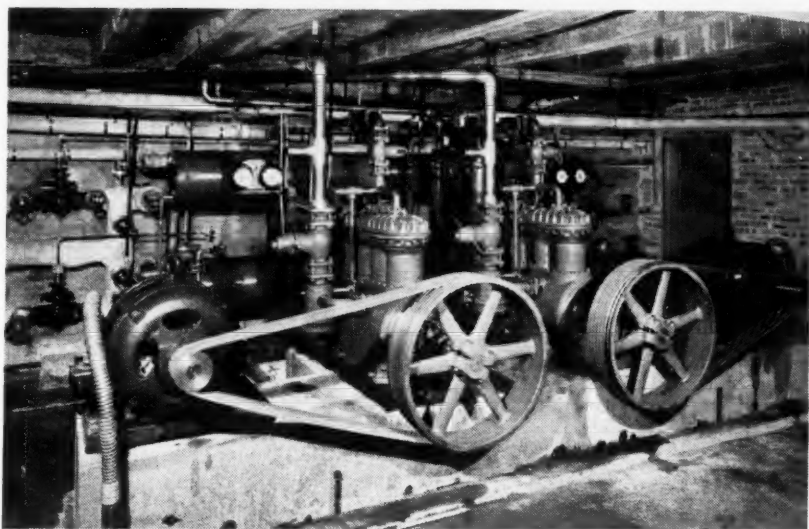
H. E. SUTTON,  
Electric Sales.

Editor's Note: The story and photographs on the cooperative exhibit which Mr. Sutton mentions are published on page 7 of this issue.

"Please continue to send me the ELECTRIC REFRIGERATION NEWS. The last issue I received was the April 10 issue. I am connected with the Frigidaire dealer here and get a great deal of benefit from this publication."—John F. Nye, 21 Greenman Ave., Westerly, R. I.



## Cooling New Theater in Chicago Suburb



These two 40-ton Reliance Freon units supply cooled air through concealed ducts to patrons of the new theater opened by Warner Bros. in Chicago's south side suburb, Beverly Hills.

## Business Leaders to Aid Purdue Research In Housing Problems

LAFAYETTE, Ind.—Members of the committee of business and industrial leaders which will work with the Purdue Research Foundation in an attempt to solve problems of better living and of better homes at lower costs were named last week by G. S. Meikle, director of research relations with industry for Purdue university.

The plan was unfolded at the first annual National Homes Conference held here June 1 and reported in the June 5 issue of the News.

One of the main research projects which will be carried out here in connection with the foundation's work is an "All-Weather Laboratory" large enough to hold an entire house. The structure will be used to reproduce all kinds of weather so that in the course of a few months a house may experience the weather it would usually encounter in the course of 20 years. Air-conditioning apparatus will be tested in this house.

The committee which will work with the industry at large and the foundation includes the following: Bennett Chapple, vice president of American Rolling Mills Co., Middletown, Ohio; H. W. Cope, assistant director of engineering, Westinghouse Electric & Mfg. Co., East Pittsburgh.

Donald M. Forgan, vice president, American Radiator Co., New York City; Foster Gunnison, president, Houses, Inc., New York City; L. S. Hamaker, vice president and general manager, Berger Mfg. Co., Canton, Ohio; R. L. Harrison, general manager, Rostone, Inc., Lafayette, Ind.

Wm. I. Howland, vice president, Illinois Steel Co., Chicago; C. B. Nolte, president, Crane Co., Chicago; J. C. Nichols, president Nichols Investment Co., Kansas City; T. L. O'Gara, Weyerhaeuser Sales Co., St. Paul; John P. Syme, assistant to president of Johns-Manville Corp., New York City; and Howard Myers, Architectural Forum, New York City.

The committee to counsel the Purdue Research Foundation on the housing project consists of: M. C. Honeywell, chairman of the board of Minneapolis-Honeywell Regulator Co., Minneapolis; Owen D. Young, New York City; John Howatt, president, American Society of Heating & Ventilating Engineers.

W. G. Kaiser, manager, Cement Products Bureau, Portland Cement Association, Chicago; F. J. Plym, president, Kawneer Co., Niles, Mich.; M. A. Smith, manager, Public Relations, U. S. Gypsum Co., Chicago; F. W. Butterworth, Western Brick Co., Danville, Ind.

H. J. Thorkelson, assistant to president, Kohler Co., Kohler, Wis.; R. G. Wallace, director of sales of Masonite Corp., Chicago; W. I. Westervelt, acting director and factory manager, Sears, Roebuck & Co., Chicago; Tyler Stewart Rogers, American Architect, New York City; Chas. Romer, Boston.

## Air-Conditioning Bureau Formed in San Antonio

SAN ANTONIO, Tex.—To promote the sale of air-conditioning equipment, and to maintain a high standard of business procedure and ethics in the local air-conditioning field, the San Antonio Air-Conditioning Bureau was formed at a recent meeting of distributors and dealers handling equipment and representatives of the San Antonio Public Service Co.

Each member of the bureau will keep an adequate display of air-conditioning equipment and will offer the services of proficient engineers to design air-movement systems.

Bureau members have also agreed to maintain an expert servicing department qualified to install and repair all types of air conditioners.

## Reliance Conditions New Movie House

CHICAGO—The Beverly Theater, Warner Brother's new theater in the Beverly Hills district here, has been air conditioned with two 40-ton Freon condensing units manufactured by the Reliance Refrigerating Machine Co.

Reliance finned cooling coils are used in the equipment. A novel system of concealed air ducts in the ceiling of the theater provides cool, draft-free air.

## 209 Conditioners Sold In Northern Calif. During 1934

SAN FRANCISCO—The Pacific Gas & Electric Co. reports a total of 209 air-conditioning jobs installed during 1934 throughout its system, which comprises most of the cities in northern California, according to R. E. Fisher, vice president.

Stores, clubs, cafes and restaurants, and theaters were outstanding in the air-conditioning field in this vicinity from the standpoint of number. Installations were made in 17 stores, totaling 37½ hp.; 10 clubs, 72 hp.; nine cafes and restaurants, 31 hp.; and nine theaters, 48 hp.

Far surpassing other installations made during 1934 in point of size was the single 100-hp. installation made in a glass works.

Small, but interesting application of air conditioning was the 2-hp. job installed in a mausoleum.

Eight offices, three banks, two hotels, four funeral parlors, four homes, and two U. S. Government offices were other installations made by the utility.

Individual applications of air conditioning of varying sizes ranging from ¼ hp. to 40 hp. including the following: bath, ballroom, bakery, creamery, factory, industrial process, hothouse, laboratory, lodge, and school.

Miscellaneous items, totaling 129 with a total horsepower of 71, include circulating fans installed principally on furnaces where an air filter is in use, and other small installations such as the circulation of cold water through pipes by small motor pumps and the distribution of resulting cool air by small circulating fans. These installations range from ¼ to ½ hp.

Average horsepower per installation during 1934 was 2.467.

	No.	Hp.
Banks	3	15½
Baths	1	3
Ballrooms	1	1½
Bakeries	1	¾
Cafes and Restaurants	9	31
Clubs	10	72
Creameries	1	1
Factories	1	40
Glass Works	1	100
Hotels	2	10½
Industrial Process	1	20
Hothouse	1	¾
Laboratory	1	2
Lodge	1	7
Mausoleum	1	2
Offices	8	23
Stores	17	37½
Schools	1	7
Theaters	9	48
Undertakers	4	7
U. S. Government	2	7
Miscellaneous	129	71
Homes	4	9

## Trilmont Forms Division For Air Conditioning

PHILADELPHIA—Trilling & Montague, which handles Norge household refrigerators and Carrier air-conditioning equipment, has organized a new department to be known as the Trilmont engineering division.

The new department, which is devoted to all phases of heating and air conditioning, is under the direction of Milton R. Dallin. The company has contracted for a series of broadcasts over station WFIL to bring the new department to the attention of the public.

## Penn Starts Series Of Meetings July 12

DES MOINES—Penn Electric Switch Co. will hold 15 regional meetings from July 12 to August 30 in leading cities in the United States and Canada to present sales, service, and engineering information to dealers, salesmen, installation and service men interested in automatic heating and air-conditioning equipment.

Afternoon sessions at the meetings will be primarily for service men, with discussions of service and engineering problems.

Exhibits of the complete line of Penn controls for heating and air conditioning will be on display. Other manufacturers who will present displays include Bell & Gossett, Taco Heaters, Watts Regulator, Hayes Corp., and Preferred Utilities.

The schedule of cities and hotels where meetings will be held is as follows:

July 12, Boston, Kenmore; July 16, Hartford, Bond; July 19, New York, Taft; July 23, Washington, Washington; July 26, Baltimore, Lord Baltimore; July 30, Philadelphia, Broadwood; August 2, New York, Taft.

August 6, Rochester, Seneca; August 9, Toronto, Royal York; August 13, Montreal, Mt. Royal; August 16, Detroit, Book-Cadillac; August 20, Chicago, Knickerbocker; August 23, Minneapolis, Leamington; August 27, Des Moines, Fort Des Moines; and August 30, St. Louis, Jefferson.

## Lawrie Bros. Sell Gibson Line in Erie, Pa.

ERIE, Pa.—Lawrie Bros. Furniture Co. of this city was recently appointed Erie dealer for the Gibson electric refrigerator.

## DON'T OVERLOOK THIS CHANCE

The Beer Dispensing Business is now considerably more active.

Permanent beer licenses are being issued.

The experimental period is over.

The incompetent dispenser is being rapidly eliminated.

The dispenser is now assured a business that is permanent.

The permanent license holder knows he can't expand his business unless he serves beer properly.

He is now receptive to ideas and suggestions which will aid him in attracting more patronage.

He can be shown definitely why a Temprite Cooler is necessary in serving beer properly.

He will welcome the actual dollar saving that Temprite makes possible.

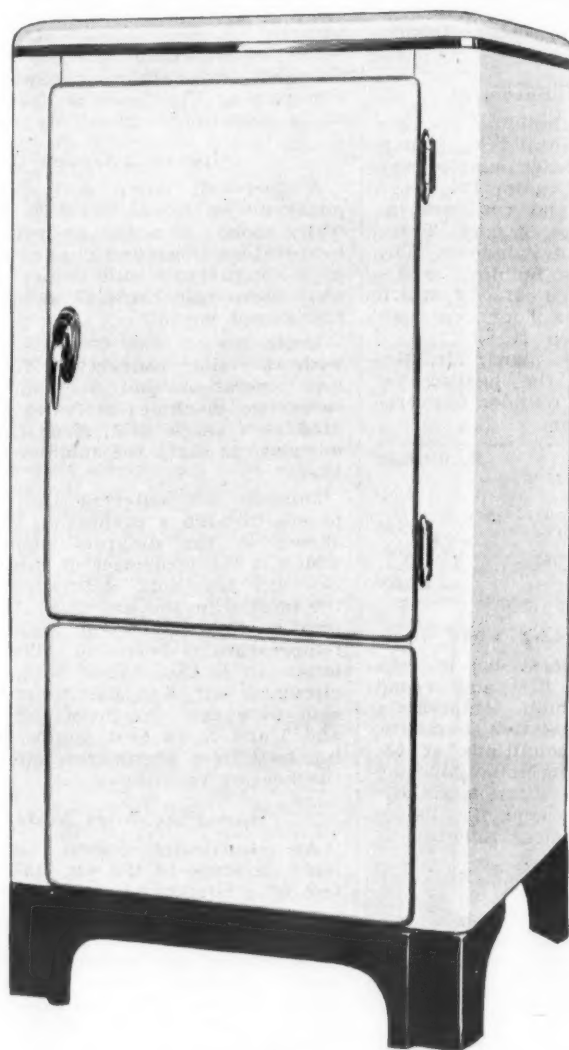
Get after this dispenser—give him the facts and get your share of this changed market.



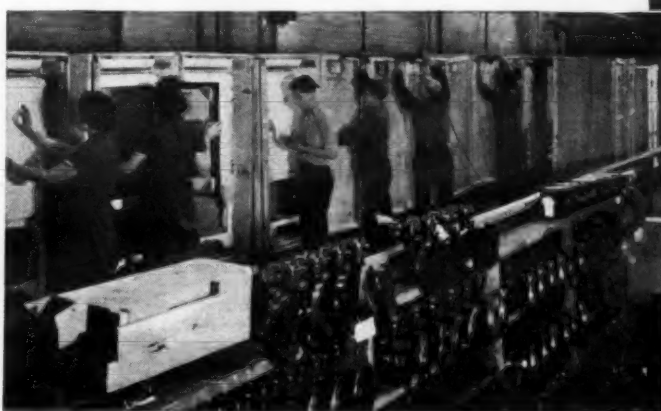
## TEMPRITE PRODUCTS CORPORATION

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ORIGINATORS OF INSTANTANEOUS LIQUID COOLING DEVICES



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MANUFACTURERS OF A COMPLETE LINE OF HOUSEHOLD AND COMMERCIAL REFRIGERATION



## AIR CONDITIONING

### All-Electric Air-Conditioned Utility Building in Jersey Uses Heat Pump Idea

TORONTO, Canada—Design, installation, and performance of an all-electric air-conditioning system employing the heat pump principle, in actual operation in a Salem, N. J. building, was described to members of the A.S.H.V.E. at the final technical session of their Spring meeting here last week by D. W. McLenegan, assistant engineer, air-conditioning department, General Electric Co.

"In recent years a number of heat pump installations have been built and at least one installation made embodying the idea of using a single set of refrigeration equipment to carry out the heating and cooling with the same equipment," Mr. McLenegan declared.

"The ideal Carnot efficiency of a reverse refrigeration cycle operating as a heat pump is given by the equation

$$E = \frac{T_1 - T_2}{T_1}$$

Under this arrangement a heat pump taking heat from a source at a temperature of 60° F., and discharging heat at a temperature of 135° F., would have an ideal efficiency of 7.95. With the outside temperature at -20°, the ideal efficiency drops to 3.74.

#### Efficiency of Heat Pump Drops

"With the actual efficiency running in the order of 60 per cent of the ideal, it is apparent that under climatic conditions where temperatures of the order of zero to -20° have to be encountered, the efficiency of a heat pump drops very rapidly and may approach a value close to unity. The net effect of this is one of two things:

"(a) If the heat pump is selected with a view of being adequate under the extreme low temperatures, then a size of compressor is involved that is so much larger than that necessary for refrigeration, that it is not only uneconomical from the standpoint of equipment investment cost, but is also out of balance from the standpoint of having approximately the same equipment performing the job in summer and in the winter; or

"(b) If an attempt is made to avoid that condition, then some provision has to be made for taking care of the extreme cold weather conditions by auxiliary means. These may take the form of fuel heaters or direct electric heaters, and some of the installations have resorted to these methods.

#### Is Heat Pump Self-Reliant?

"In adopting that solution, however, there is definitely raised the question of whether the heat pump as a method of heating is a self-reliant piece of equipment or could even be developed as such. In brief, none of the heat pump installations previously made have been complete, or all heat pump installations."

Mr. McLenegan said that it was apparent for some time to those responsible for the development described in his paper, that if electric heating of homes, stores, offices, and similar buildings is to overcome the handicap of, first, a 70 per cent heat loss in going from thermal to electrical energy involved even in the best steam generating plant, and, second, even more important, the excessive costs of large distribution facilities necessary in any straight 1:1 heat conversion process when going from electrical to thermal energy; and if electric heating is to overcome the handicap of the fixed charges involved in cost of equipment, then the reverse refrigeration cycle of heating, which makes possible the use of the same equipment for cooling in summer and heating in the winter, and which gives the maximum economy in use of electrical energy, with a minimum requirement of electrical capacity to take care of a given installation, would be able to overcome all such handicaps.

#### Type of System Needed

Hence, in considering the heating, cooling, and air-conditioning system for the particular building described in this paper, the first decision made was that it would be an all electric and all compressor system.

In order to meet the difficulties with regard to the lack of balance between summer and winter refrigerator capacity already pointed out, and the difficulties of the concomitant heavy investment cost that would be involved in an all compressor system if the source of heat were the outside atmosphere (since the building located in southern New Jersey had cycles of zero F. and even lower temperatures to contend with) two possible solutions were considered:

(1) A storage system. With this system heat obtained by the heat

pump from the outside air under favorable (mild temperature) conditions would be stored at a moderate temperature (between 60 and 80° F.) using that portion of the compressor capacity not required for immediate heating. This storage would be made available as a source of heat for the compressors under conditions of exceedingly low outside temperatures when conditions for obtaining of heat directly by the heat pump from the outside were unfavorable, and

(2) A more simple system, in which the heat would be obtained from water supplied at a constant temperature from a deep-well.

#### Well Water Utilized

After considering the various technical problems involved which had theretofore not been definitely worked out, it was decided not to attempt too much in the first installation and to try the simpler of the two solutions, that is, utilize a deep-well water supply as the source of heat in the winter and as a pump for the rejection of heat in the summer-time.

The building heated, cooled, and air conditioned by the equipment described by Mr. McLenegan is a two-story and basement brick and steel reinforced concrete structure belonging to the Atlantic Electric Co., a subsidiary of the American Gas and Electric Co., located at Salem, N. J.

The lower floor is devoted to a display room, service department, and offices, while the entire second floor is used as a combined demonstration hall and auditorium.

#### Equipment in Basement

Basement of the building is used for storage and contains the pump used to give the water supply, and the air-conditioning equipment.

The brick walls and roof are insulated with 2 inches of cork. There are 1,240 sq. ft. of windows. The total volume of the building is approximately 76,800 cu. ft., of which the first and second floor represent a volume of 55,200 cu. ft.

From the building plans, Mr. McLenegan explained, the heating requirement for 0° F. outdoor temperature was found to be:

	B.t.u./Hour
Conduction loss, first and second floors	143,000
Warming the ventilation air for first and second floors	107,000
Basement heat loss	35,000
<b>Total</b>	<b>285,000</b>

#### Summer Cooling Load

For summer operation, it was planned to cool the first and second floors to 80° dry-bulb temperature with 50 per cent relative humidity, assuming outdoor conditions at 95° dry-bulb and 75° wet-bulb. Allowing for 1,200 c.f.m. of ventilation air, the maximum summer load is 108,000 B.t.u./hour distributed as follows:

Sensible Heat	B.t.u./Hd.
Conduction	33,300
Solar Radiation	18,300
Ventilation Air	19,600
40 People	8,800
<b>Total</b>	<b>80,000</b>
Latent Heat	B.t.u./Hd.
Ventilation Air	20,800
40 People	7,200
<b>Total</b>	<b>28,000</b>
<b>Total</b>	<b>108,000</b>

Total air flow was based on the following conditions:

(1) Air flow to be adequate for maximum winter heating at relatively low discharge temperature.

(2) Summer cooling to be accomplished with air not more than 15° below room temperature.

(3) Air flow to be small enough to avoid excessive duct sizes.

"A total air flow of 5,500 c.f.m. was selected for conditioning the first and second stories of the building, which represent a volume of 55,200 cu. ft.," the speaker explained.

"The basement is heated by the machine losses, but is not air conditioned.

"Thus, air is circulated through the first and second floor space at the rate of one change every 10 minutes, consistent with liberal practice. The system is designed for the admission of 1,200 c.f.m. of outdoor air, with provision for increasing this quantity to 1,700 as desired.

"Average occupancy of the building is about 25 people. The ventilation air intake thus represents 48 c.f.m. per person for summer or winter conditions, which is rather high. However, in terms of the maximum expected, which is 60, it represents a value of only 20 c.f.m. per person and it was felt that until actual experience indicated that less ventilation air could be employed, it was not desirable to go below this value."

#### Heating Load

The heat pump equipment alone is not quite adequate for a sustained period of zero weather, Mr. McLenegan declared, since the capacity was planned to be 260,000 B.t.u./hour and the maximum requirement was 285,000.

It was felt, however, that the selection of this capacity was justified, since the building has a large lighting load which could be called on in extreme cases. Furthermore, the building is well insulated and would not require the maximum heating effect, except during a prolonged period of zero weather, which very seldom occurs.

The system comprising the air-conditioning installation is shown schematically in Fig. 1 and a description of its operation is given.

#### Operating Cycle

A deep-well pump with 3-hp., 3-phase motor, forces water through 4 water coolers in series. As refrigerant evaporators, these units are connected to 4 compressors and thence to the condensers (air heaters) as separate refrigerant circuits.

Units Nos. 2 and 3 are arranged with reversible connections for summer operation and for simplicity, these two machines are always operated as a single unit, since they are adequate to carry the summer cooling load.

Outdoor air entering the system passes through a preheating coil, not shown in the diagram of Fig. 1, which is the condenser of heat pump No. 1. This unit, controlled by a thermostat in the entering air, operates continuously when the outdoor temperature is below 40°. The ventilation air is then mixed with the recirculated air, and passes in succession over the condensers of Nos. 2 and 3 and No. 4 heat pumps, absorbing heat to a degree consistent with the heating requirements.

#### Humidifier Adds Water

An electrically heated humidifier adds moisture to the air, under control of a humidistat.

The air is then distributed through the building through a conventional high velocity duct system, using overhead horizontal delivery and baseboard returns. The velocity in the supply mains is 1,400 f.p.m., in the branches, approximately 1,000, and at the outlet's approximately 750, which

## All-Electric Conditioning System

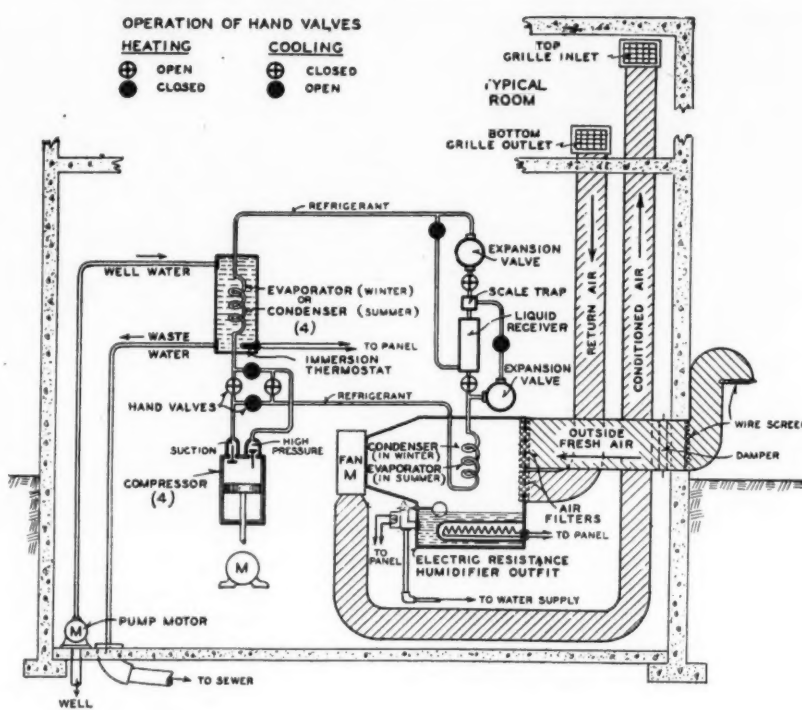


Fig. 1. Diagram showing construction of air-conditioning system described in the accompanying article.

permits adequate travel and mixing with the room air.

Since all air delivery, whether heated or cooled, enters through high wall registers, the air distribution had to be planned to avoid stratification during the heating season. This problem was successfully solved by locating a number of ample return openings at floor level, to remove the cooler air, and by using a relatively large total flow of air in proportion to the heat delivered.

Under the most severe conditions, the speaker advised, the temperature of the air delivered does not exceed 105°; and the air at this temperature is not too light to mix readily.

With continuous circulation and a minimum cyclic variation of the air delivery temperature, it was expected that comfortable conditions would be maintained, as regards both the vertical temperature variation and the temperature-time variation. Under maximum load conditions, the refrigerant condensing temperature of the last heating unit (No. 4) was planned not to exceed 135° F.

#### Lower Temperature Better

"Considering the heat pump only," commented Mr. McLenegan, "greater efficiency could have been achieved by delivering air at a lower maximum temperature, since the compressors could then have been operated at lower condensing temperatures and hence with lower power input.

"This, however, would have required larger ducts, since a greater air flow would have been needed for the same heat delivery.

"Conversely, the use of a smaller quantity of hotter air would have impaired the heat pump performance, as well as the vertical temperature distribution. The authors believe that the outlet temperature selected represents a good compromise for this installation, although climate, building construction and further design and operating experience may call for a modification of this figure."

#### Four-Cylinder Compressors

Compressors are 4-cylinder, single-acting units, operating at 400 r.p.m., each belted to a 5-hp., 3-phase, 60-cycle, 1,800 r.p.m. induction motor, and are of a type commonly used in comfort cooling installations. Although the air-cooled condensers, which heat the conditioned air in winter, are not built integrally with the compressors, each compressor has its own liquid receiver, through which the refrigerant passes before returning to the evaporator.

The sizes of the air-cooled condensers have been proportioned to give efficient operation, taking into account also the first cost of this surface. The condenser for machine No. 1, which operates only as an air preheater in winter, consists of 4 coil sections and is relatively small, since the air entering through this condenser is cold and the unit operates at low discharge pressure.

Machines Nos. 2 and 3 each have a 5-section condenser which the air enters at an average temperature near 60° in winter.

Condenser No. 4 consists of 10-sections, since it must dissipate heat to air which has already been somewhat heated in cold weather by units Nos. 2 and 3; hence, this surface is made large to reduce the refrigerant-to-air temperature difference, and thereby improve the coefficient of performance of this machine.

An indoor thermostat starts and stops the machines, but their availability is determined by separate thermostats, responsive to outdoor temperature and located in the incoming air stream.

Thus, machine No. 4 runs alone and intermittently at outdoor temper-

atures above 54°. From 54 to 40°, machines 2 and 3 are also available. Below 40° machine No. 1 is added and runs continuously. Below 23° machines Nos. 1 and 4 operate continuously and Nos. 2 and 3 are available.

#### Advantages of Sequencing

"The purpose of the sequencing scheme," Mr. McLenegan explained, "is to operate at all times with a minimum of excess capacity, and hence with lowest possible refrigerant condensing temperature. This has two advantages, namely:

"(1) For any required average rate of heat output, continuous operation with low condenser pressure yields a higher coefficient of performance than intermittent operation at high condenser pressure and higher momentary output.

"(2) It is desirable from the comfort standpoint to have continuous air delivery, using slightly heated air in mild weather, and increasing the air temperature in colder weather. In contrast, a single machine, or 4 machines always operated concurrently, would cause the hottest air to be delivered intermittently in the mildest weather."

The air-conditioner fan is operated continuously and at constant speed. By a system of interlocks, the water pump is started automatically whenever any of the compressors are started by the indoor thermostat. In case of pump failure the water coolers are protected from freezing by immersion thermostats (with 40° setting), located in the lower sections of the water cooler.

The humidifier in the air conditioner is started and stopped directly in response to a room humidistat.

#### Changing System for Seasons

Mr. McLenegan said the change-over from winter to summer operation involves:

(a) Transfer of the control circuit to reverse the operation of the room thermostat. For summer operation, a cooling rather than a heating requirement is indicated when the thermostat closes its contacts.

(b) Manipulation of valves. The air-cooled condensers now become refrigerant evaporators, in which the flow is regulated by automatic expansion valves. These valves, normally by-passed in winter, are cut in by switching to a different refrigerant manifold connection. The water coolers now become water-cooled condensers, hence the expansion valves of these units are by-passed. By reversing the flow through the liquid receiver, the process of reversing the refrigerant cycle is completed.

#### Change Made Easily

As indicated by the schematic diagram Fig. 1, this change is easily accomplished. Distinguishing colors have been used for winter and summer valves, to aid the operator.

"During the test period in February, 1935," Mr. McLenegan declared, "the equipment was operated as a heating plant. The outdoor temperature varied between 33° F. and 46° F., hence the equipment was operating between one-third and one-half of its maximum capacity, and the tests cover the case of full capacity operation only for short periods during which the indoor temperature was allowed to rise slightly above normal.

"However, by determining from these tests the constants of the various units of the equipment, it is possible to calculate accurately the performance at other load conditions. This is true particularly because the temperatures of the water-heated evaporators are confined to a narrow range, and do not depend directly on

(Concluded on Page 11, Column 1)

## Banishing a Bookstore's Summer Slump



Above the door in Bennett Schneider's bookstore in Kansas City is a Frigidaire air conditioner which lures patrons into the shop to browse around—and oftentimes to buy.



## Heat Pump Principle Used in All-Electric Conditioning System

(Concluded from Page 10, Column 5)  
the temperature of the outdoor air." Measurements taken in the tests were:

**Water**  
(a) Rate of flow.  
(b) Temperature of water entering and leaving each cooler. These measurements were made by thermocouples soldered to the water pipes; also by thermometers located in wells, and these readings were checked by bleeding off water at three points (inlet, intermediate, and outlet) using both thermocouple and thermometer measurements.

These readings represent one method of measuring heat absorbed by the evaporators.

### Measurement of Refrigerant

**Refrigerant**  
(a) For each of the 4 heat pump units, suction discharge pressures were read, and converted to equivalent temperatures. Readings of temperature were taken at each evaporator outlet and at each compressor intake and discharge to indicate the degrees of superheat at these points. Temperatures at each condenser inlet, and outlet were recorded, and also liquid temperatures before the expansion valves, to indicate the degree of sub-cooling of the liquid refrigerant. These points determine the refrigerant cycle, and are used in conjunction with standard compressor test data, to determine the heat output of the machines.

In determining the performance of the system, the power used by the air-circulating fan and by the electric humidifier have not been taken into account. Fan and humidifier elements are part of any winter air-conditioning system, and are not directly related to the method of generating heat for the building.

### Heating Performance

Using the equipment for heating, rather than cooling, the coefficient of performance, Mr. McLenehan said, has been calculated from the test data on two bases:

(1) (Condenser output plus machine losses) divided by (Electrical input to the compressors.)

(2) (Condenser output plus machine losses) divided by (Electrical input to compressors and water pump.)

"Work of compression is included as useful output," said the speaker, "the machine losses also may justly be included in the useful heat output since this heat is used to maintain temperature in the basement, which is used only for files and storage, and is not air conditioned."

"Method 2 is really the correct criterion of performance, since the pump is an essential part of this particular system. The pump power increases the total power input, but does not increase the heating effect within the building, except by the small amount of the motor losses. Hence, the coefficient of performance is lowered by including this item."

"Without considering the pump, the coefficient of performance for the composite equipment averages about 3.9, and varies somewhat with outdoor temperature, that is, with the number of machines in operation."

"Performance is best at the extremes of the operating range. In mild weather, only one of the 4 units operates, and the unit having the largest condenser is logically selected for this service, since it can operate with the lowest refrigerant condensing temperature. This and the high evaporator temperature of a single machine with maximum water flow yield a high coefficient of performance."

### Effect of More Units

"As units are added for colder weather, more heat is extracted from the water, and some of the units must therefore operate at lower evaporator temperatures with poorer performance at intermediate outdoor temperatures."

However, as lower incoming air temperatures are encountered, the preheater and the units immediately following are able to operate at very low condensing temperatures and the high coefficient of performance of these individual machines raises the average of performance of the group in very cold weather. With air entering at 0° F., the preheater unit alone develops a coefficient of performance of 5.0.

"The order in which machines are added affects the performance by as much as 10 per cent at certain outdoor temperatures. As would be expected, best performance is obtained by using as a base load machine the one having the largest condenser, and by adding machines in such order that the largest remaining condenser surface is associated with the lowest available temperature of entering air."

### Performance Satisfactory

"The performance throughout the entire heating season of 1934-35 has been as expected," said Mr. McLenehan, "the equipment functioning perfectly with few minor exceptions enumerated."

"The lower floor of the building, being the office of an electric utility in a fairly substantial community, presents a rather difficult problem in maintaining constant levels in heating and air conditioning. With people walking in and out almost continuously, and with a wide variation in traffic over a weekly or monthly interval, it would be expected that a particularly heavy strain would be placed on the regulating and air-conditioning equipment."

### Proper Temperature Maintained

"Nevertheless, throughout the entire period an equable and proper temperature was maintained under all conditions of outside temperature."

"Although integrated results of the entire winter's operation are not yet available, monthly data up to the end of April have been obtained. The data given in Table 1 covering the month of February, are indicative of a typical month representing neither the extreme low temperature nor the extreme mild weather conditions encountered."

Table 1—Actual Performance Data On Salem Heat Pump Jan. 31 to Feb. 28

Outdoor Temperature	Deg.
High	55
Low	30
Average	34.5
Indoor Temperature	
High	78
Low	70
Average	74
Incoming Water	Average 57
Outgoing Water	Average 63
Water Consumption	915,300 Gal.
Electric Consumption	Kwh.
Fan Motor, 2 hp.	582
Pump Motor, 3 hp.	1,502
Humidifier	1,503
Compressor No. 1	2,085
Compressor No. 2	1,370
Compressor No. 3	1,283
Compressor No. 4	1,015
Total Metered	9,475

A few minor difficulties were experienced during the winter season. These consisted of ordinary adjustment troubles on compressors, gas joints, belts and pulleys but all of these were easily corrected.

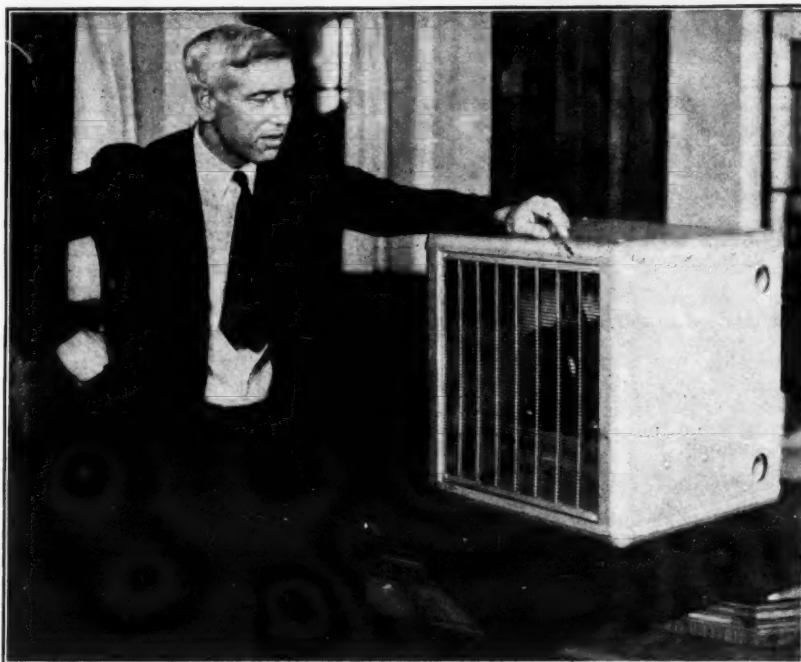
Perhaps the most serious difficulty encountered was the tripping of the water pump motor due to an incorrect operation of the thermal overload relay, resulting in a stoppage of water under a condition where the compressors were running. This resulted in frozen evaporators and it was necessary to take the compressors out of service for a day to thaw the evaporators out.

This, however, has been taken care of by a change in the control wiring, giving the proper interlock to prevent a repetition of this difficulty.

In summer, using only machines Nos. 2 and 3, the system will operate as a conventional direct expansion system with water cooled condensers. These 2 units meet the cooling requirements and will be operated intermittently under room thermostat control with continuous air flow.

Neglecting the water pump input, a coefficient of performance of 3.0 is expected; including the water pump, coefficient of performance will be approximately 2.3. These figures are

## For the Air-Conditioning Market



President R. N. Trane of the Trane Co. poses with one of his new low-cost suspended-type air conditioners for winter or summer use.

based on the cooling effect produced, rather than on condenser heat delivery.

The kw. demand of the system in summer, including the pump, will be approximately 55 per cent of the winter demand, although the maximum summer load in B.t.u.'s is only 40 per cent of the maximum heating load.

"Due to the many new elements involved which had to be analyzed for this particular installation, it is difficult to evaluate correctly the initial cost of this type of system as compared with more conventional plants," the speaker said.

"One item, the cost of heat transfer surfaces, is inherently high since the condenser temperature must be low compared to steam coil temperatures to permit efficient operation of the heat pump."

### Lower Costs in Future

"However, with the experience gained from this installation, it is expected that the cost of future installations of this type should not greatly exceed that of equivalent year 'round systems, which use combustion equipment for heating and mechanical refrigeration for cooling."

"For installations in milder climates where the maximum cooling and heating loads are more nearly equal, the excess cost of the reverse cycle equipment needed for heating tends to disappear completely."

In conclusion Mr. McLenehan declared that experience both in test and performance of the installation described dictates no substantial, and only a limited number of minor changes for future applications of the same type.

## G-E Sells Oil Furnaces & Conditioners in Nome

NOME, Alaska—General Electric winter air-conditioning equipment, to be installed here soon, includes four oil furnaces for use in the homes of employees of the Hammond Consolidated Gold Fields, and one oil furnace and two air conditioners to be used in the new Miners & Merchants Bank building.

The new bank building, of steel frame construction with 3 in. of cork insulation in all exterior walls and roof, will be heated by a split system, utilizing both forced hot water and conditioned air.

The main banking quarters will be served by the oil furnace for hot water, a water circulator, and a central plant winter air-conditioning system.

Second floor will be supplied from the same furnace through a second water circulator, with a ceiling suspended conditioning unit used to circulate, filter, and humidify the air on this floor.

Behind the order for this equipment is an interesting story. Back in the fall of 1934, a Nome power company official wished to buy a General Electric oil furnace from the Seattle Plumbing Supply Co., dealer in Seattle for G-E air-conditioning equipment. Alaska was not at that time included in the company's territory, and he was informed of the company policy of not selling where it could not serve.

As a result a Nome bank executive sent a telegram to his brother in Seattle, specifying that if the Seattle Plumbing Supply Co. would not ship the furnace, he was to buy one and ship it to the would-be buyer at Nome.

The furnace was shipped, but the entire business district of Nome was wiped out by fire before the shipment arrived, including the building in which the furnace was to be installed. The purchaser sold the furnace to S. H. Burgh for installation in his tavern, which had escaped the fire.

## Trane Uses Propeller Type Fan in Suspended Air Conditioner

LA CROSSE, Wis.—Now being introduced by the Trane Co. here is a new propeller-type suspended air conditioner for summer cooling or winter heating.

The smallest size of this unit will be marketed for \$70, declares Reuben N. Trane, president of the Trane Co.

In the construction of this unit the fan is located inside in the middle of the unit, between the Trane "freeflo" grille at the front and the coils at the rear.

In operation the fan draws the air over the cooling or heating coil (whichever the case may be) and then blows it out through the grille at the front. Moisture removed from the air drains from the cooling coil into the pan at the bottom of the unit.

The grille on the front of the unit turns the currents of air upward as they are discharged from the unit and permits the cooler air strata to settle gently over the room occupants. The grille is removable for adjustment of the expansion valve and oiling of the motor.

## Air Coolers to Be Placed In Metropolitan Opera

NEW YORK CITY—The half-century old Metropolitan Opera House here will be air cooled next season and its ventilating system improved, opera and real estate company directors declared last week.

## Frick System Cools Oklahoma Utility

OKLAHOMA CITY—The Frick air-conditioning installation made last season in the main office building of the Oklahoma Gas & Electric Co. here, provides for air conditioning of 18,900 sq. ft. of floor space, comprising the whole of the first and fifth floors and part of the second floor, which contains the lighting studio.

The system is designed to maintain a temperature of 80° F. dry bulb and 50 per cent relative humidity inside, when outside temperature is 95° and the humidity is 44 per cent. This gives an effective temperature of 74°.

Of the indirect type, the system consists essentially of refrigerating and heating equipment; four suspended type air conditioners on the first floor; one on the second floor; and three on the fifth floor, these being located in the fan room and connected with duct work running to the various offices.

Compressors and heating equipment are located in the machine room in the basement. The two 6x6 compressors are driven by 30-hp. motors, with condensers of the horizontal shell-and-tube design, connected into a horizontal water cooler of the same type as the condensers.

The water is circulated by two turbine-type pumps. The cooled water first passes to a pair of 1,100-gal. storage tanks, through hard drawn copper pipe to the coils in the eight air units. The condensing water is circulated through an atmosphere tower on the roof of the building.

Each of the air conditioners is equipped with finned-tube copper coils, which are used for both cooling and heating; viscous spun glass filters to remove the dirt and dust; and blower-type motor-driven fans to keep the air in motion.

The two small units on the south side of the first floor do not handle any fresh air. All the others include spray type humidifiers.

As the first floor is quite open, little duct work is used and the air in general is distributed directly from concealed units through high velocity diffusers-type grilles. The return air is picked up at the floor line and brought back through vertical ducts.

Fresh air is introduced through ducts to the large conditioners at each end of the space. The fresh air ducts are all of such a size that outside air in quantities equal to the full capacity of the conditioners can be introduced.

The fifth floor is partitioned off into private offices. To aid in air distribution, this floor is divided into three zones, each zone being supplied with air from a separate conditioner.

To conserve space in the engine room, the three conditioners were placed on top of one another and were provided with a common return and fresh air supply, but have separate outlets.

The supply duct was hung from the ceiling in the corridor and was furred in by a new ceiling.

The Tom Dolan Heating Co. installed this equipment for the Embrey Refrigerating Co.

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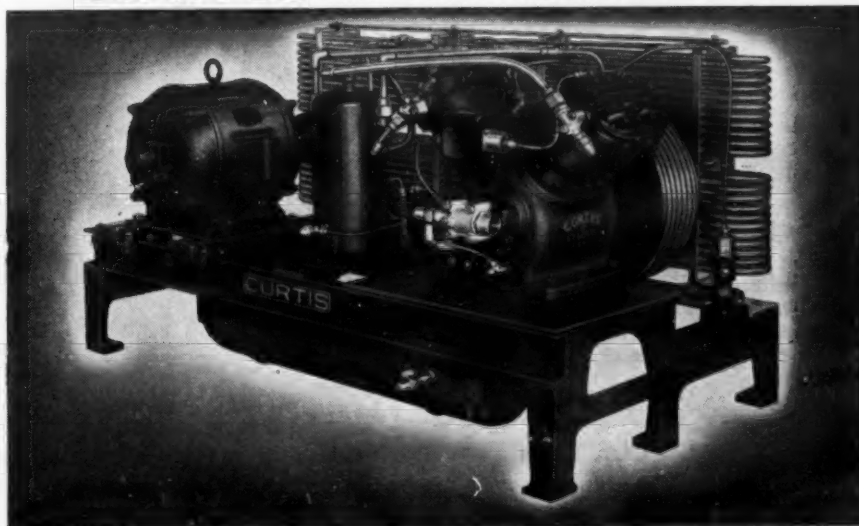
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## SERVICE

### High Side Float Valves with Flooded Evaporators

**Editor's Note:** Mr. Newcum's articles constitute a manual of information on present-day refrigeration systems which will add to the service man's knowledge of refrigeration, and which will assist him in meeting specific problems in servicing operations in the field.

The article in this issue discusses the operation of high side float valves with flooded evaporators.

Following is an outline of Mr. Newcum's articles as they have appeared in the News.

#### April 10 Issue

##### Chapter 1—THEORY OF REFRIGERATION

This chapter deals with fundamentals of refrigeration. Inasmuch as refrigeration is really a process of the removal of heat from a given space, "these" fundamentals consists mainly of the terms, definitions, and physical laws which are involved when heat is transferred from one substance or space to another location.

#### April 17 Issue

##### Chapter 2—PRINCIPLES OF MECHANICAL REFRIGERATION

Three principal parts of the household refrigeration system—cabinet, condensing unit, and evaporator—are

compressor body assembly, housing assembly, crankshaft and connecting rod assembly, eccentric shaft and connecting rod assembly, piston and piston valve assembly, and discharge valve assemblies. Service operations on these various compressor parts are outlined.

#### May 29 Issue

##### Chapter 4—CONDENSING UNITS (Instalment 2: rotary compressors.)

Rotary compressor design, operation, and servicing are described, with Norge and Majestic makes discussed in some detail.

#### June 5 Issue

##### Chapter 4—CONDENSING UNITS (Instalment 3: care and servicing of shut-off valves and gaskets.)

Operation and servicing of the various shut-off valves are outlined in this article, and suggestions given on the care of gaskets.

#### June 12 Issue

##### Chapter 4—CONDENSING UNITS (Instalment 4: condensers.)

Various types of condenser design are described and illustrated, and suggestions made for their care and servicing.

### High Side Float Valves

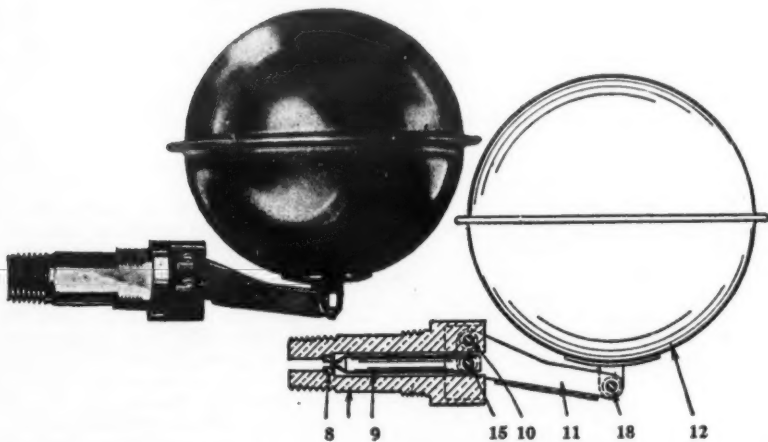


Fig. 93—Photograph and cross section of Kelvinator high side float.

described briefly in this chapter, and the operating cycle of a refrigerator is explained in detail. Also published with this chapter is the refrigerant pressure-temperature chart and an explanation of service gauges.

#### April 24 Issue

##### Chapter 3—COMMON REFRIGERANTS

Properties which are necessary for a good refrigerant are outlined in this chapter, which also gives a detailed comparison of the physical properties and characteristics of the following refrigerants: sulphur dioxide, methyl chloride, ethyl chloride, ammonia, and Freon.

#### May 1 Issue

##### Chapter 4—CONDENSING UNITS (Instalment 1: description of various compressor parts.)

Design and functions of the following compressor parts are described:

#### June 19 Issue

##### Chapter 4—CONDENSING UNITS (Instalment 5: liquid receivers.)

Described in this instalment are liquid receivers used with air-cooled condensers. Horizontal and vertical receivers for flooded and dry systems are explained.

#### June 26 Issue

##### Chapter 5—EVAPORATORS (Instalment 1: flooded evaporators with low side float valve.)

This article explains the operation of the flooded system with the low side float valve and gives information on service problems that are likely to be met.

### 65. Highside Float Valves & Evaporators

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### Servel System Employing Low Pressure Control

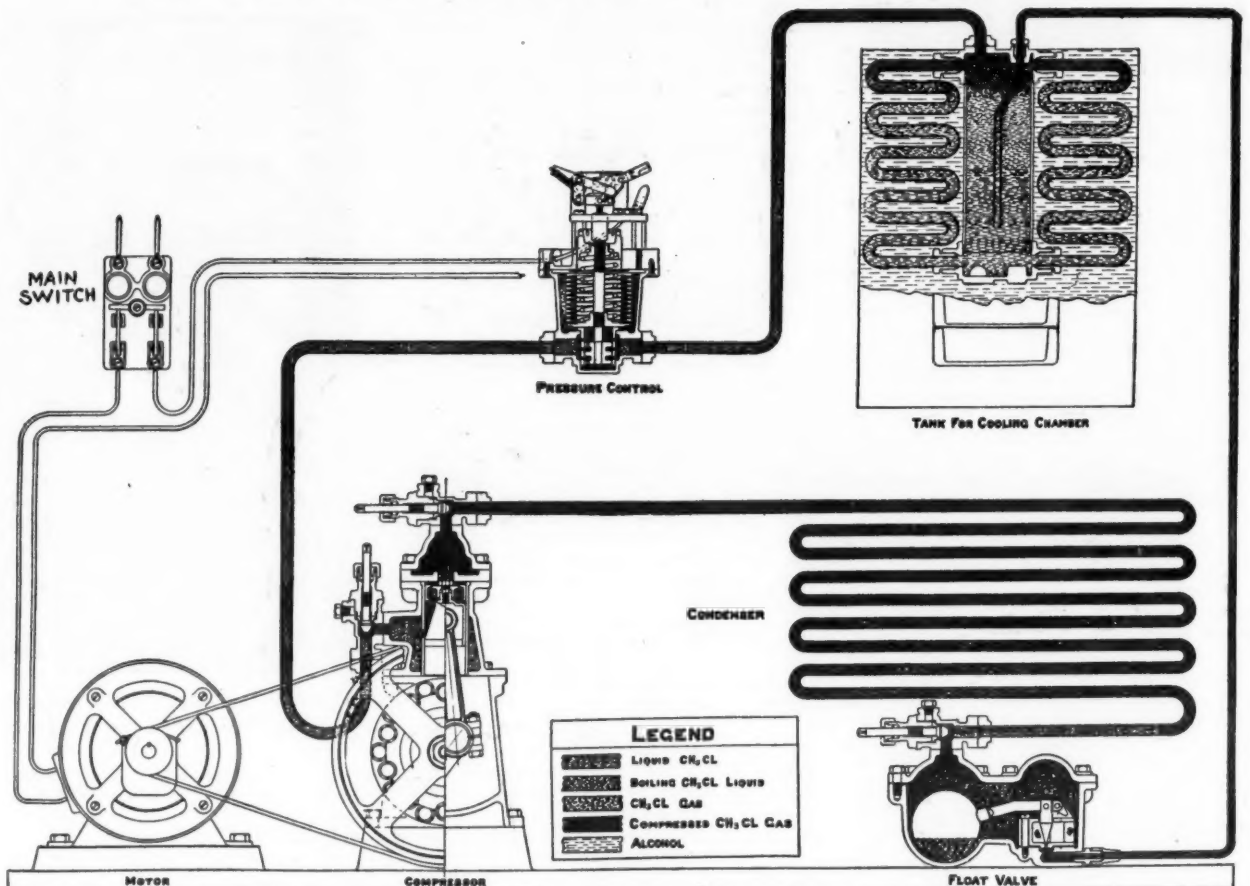


Fig. 95—Servel high side float system which employed a low pressure control.

high side float valve differ materially from the flooded evaporators using the low side float in that they do not house the float valve mechanism.

High side float valve may be defined as being a float valve assembly located in the high pressure side of the system to let the accumulated liquid out of the high side into the low side to a predetermined level in the float chamber.

The high side float valve is usually located in the liquid receiver, that is, the float chamber is the liquid receiver.

A Kelvinator high side float valve is illustrated in Fig. 93. In Fig. 94, the float valve is shown in the liquid receiver or float chamber.

Function of the high side float is such that when the system is charged with the correct amount of refrigerant and oil, there will be a definite liquid level in the float chamber and the evaporator will be flooded with liquid up to near the top (Fig. 94).

When the system is put into normal operation, evaporation takes place and the heat laden vapor is returned to the compressor via the suction line which is taken off the top of the evaporator.

This vapor is compressed and condensed, flowing into the float chamber (liquid receiver). This amount of new

liquid accumulating in the float chamber raises the liquid level, hence the float valve, and the valve opens, allowing a like amount of liquid to enter the liquid line and evaporator to replace the amount previously evaporated.

This cycle is repeated automatically while the system is in operation. The greater the amount of evaporation, the greater the amount of liquid accumulated and the higher the float will rise and the wider it will open.

In normal operation, the accumulation of liquid is regular and the float may be found to remain partially open, supplying a constant regulated amount of liquid to the evaporator.

The refrigerant charge in the high side float system is critical, that is, there is a very definite charge for each individual system, and if this charge is over or under this amount, the system will not function properly.

An overcharge of liquid will tend to maintain a higher level in the float chamber. This will cause the float to remain up and open, supplying more refrigerant to the evaporator than it is capable of handling, causing the liquid to overflow from the evaporator down the suction line. This liquid in the suction line will cause it to sweat or frost, and will cause the operating back pressure to remain high.

An undercharge of refrigerant will result in a lower liquid level in the float chamber, which will have a tendency to keep the float down and closed, not supplying sufficient liquid to the evaporator.

The refrigerant charge must be properly balanced so that in normal operation the entire evaporator will hold frost, but so the frost line will not leave the refrigerator.

A very simple method may be used to determine the proper charge for this type of system. A shortage of refrigerant will result in a low operating back pressure as registered on the compound gauge.

When this condition is determined, refrigerant should be added to the system in the form of vapor through the low side in small amounts at a time. As the refrigerant is being added, it will be compressed and condensed into a liquid and flow into the float chamber. This will cause the float to rise, releasing this liquid and the back pressure should increase. When the back pressure has returned to normal, the system should be allowed to operate until the evaporator has frosted.

The suction line connected to the evaporator should be checked. If it frosts a few inches from the evaporator, but not out of the refrigerator, the charge is correct. If it frosts out of the refrigerator, a small amount of gas should be purged from the system, and the frost line checked. As the purging continues, the frost line should come back into the refrigerator.

When the balance is correct, the back pressure will be steady and will continue to decrease as the evaporator becomes colder throughout the normal cycle, just as in the low side float system.

The high side float system may be used with either the low pressure control or thermostatic control. High side floats should not be used in multiple, that is, two or more high side floats should not be used with one condensing unit on two or more evaporators.

The Servel high side float system (Concluded on Page 13, Column 1)

### Kelvinator Flooded System

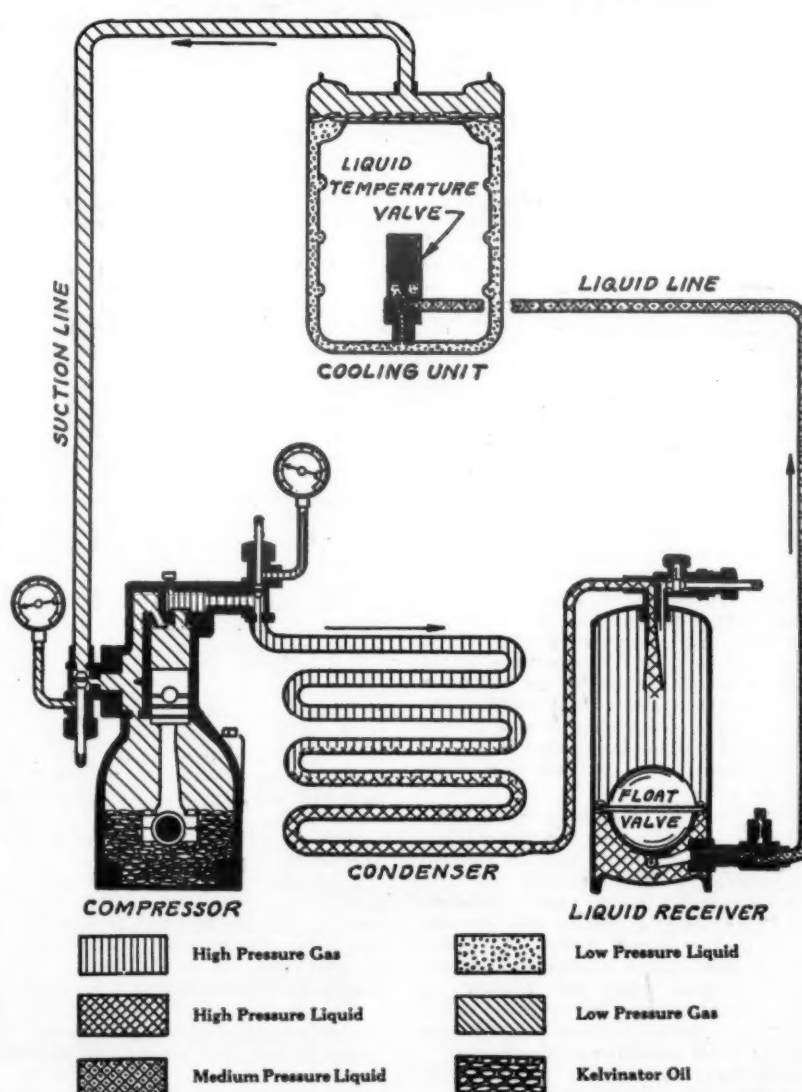


Fig. 94—Refrigerating cycle of Kelvinator flooded system using high side float valve. The float valve is the same as shown in Fig. 93.

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## Servicing Highside Float Valves

(Concluded from Page 12, Column 5)

is shown in Fig. 95. This system employs the low pressure control. A shortage of refrigerant will cause the machine to short cycle.

This is due to an insufficient amount of liquid being supplied to the evaporator and a resulting lower operating back pressure, which causes the switch to open before the proper evaporator temperature is reached.

As the evaporator is warm from insufficient liquid, the pressure rapidly builds up causing the switch to close, operating the compressor for only a short time.

An overcharge of refrigerant in this type of system using the low pressure control will result in long or continuous operation and a frosted suction line.

Inasmuch as expansion takes place

### Temperature Valve

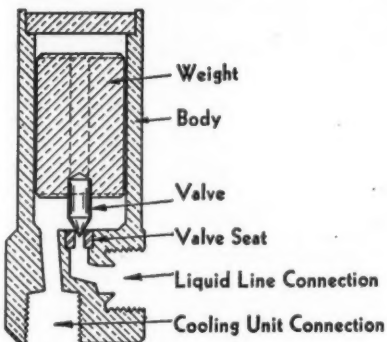


Fig. 97—Kelvinator liquid temperature valve.

when the high pressure liquid is released into the low pressure side of the system, which in the case of the high side float system is between the float valve needle and seat, frosting starts at this point.

Most high side floats are located on or near the condensing unit. Consequently the liquid line from the outlet of the float to the evaporator is on the low pressure side and is subjected to frosting conditions.

Note the liquid temperature valve in Figs. 94, 96, and 97. This valve is designed so that a weight with a needle type valve is housed in a valve body through which the liquid passes before being admitted to the evaporator. This weight valve tends to restrict the liquid and maintains an intermediate pressure in the liquid line of approximately 25 lbs. per sq. in.

This higher pressure in the liquid line prevents evaporation and the liquid line maintains a temperature above freezing and does not frost. Often the liquid line from the float is insulated to prevent frost from accumulating on the line.

Air in a high side float system will result in a higher operating back pressure, and if the pressure is sufficiently high, it may have a tendency to hold the float down at a level slightly lower than normal, thus affecting its normal operation.

In some designs of high side floats, the air becomes trapped in the float chamber and causes what is known as gas binding. This air, being undensifiable, should be purged from the float chamber to relieve this condition.

A leaking float will give the same effect as an overcharge of refrigerant if the leak is sufficiently large. A very

## SERVICE OPERATIONS

A SERIES OF LESSONS OUTLINED FOR THE USE OF THE SERVICE MANAGER IN INSTRUCTING BEGINNERS IN SERVICE WORK

### No. 12—Purging Air from Compressor (Methyl Chloride)

By K. M. Newcum

#### REASON:

Same as No. 11, except moisture in methyl chloride has no effect upon iron and steel, as it does with SO<sub>2</sub>. Air in a methyl system as well as the sulphur system, always collects at the top part of the condensing coil, which is the reason for purging out of the discharge shut-off valve.

#### PROCEDURE:

- Same as A in No. 11.
- Same as B in No. 11.
- Connect 1/4-inch purging line to service fitting on combination gauge set, and run into clean dry glass jar.
- Crack the service valve into which the high pressure gauge of combination gauge set is screwed, allowing the gas to escape into the bottle slowly.
- Watch the gauge reading, and continue purging slowly until a normal gauge pressure is reached.
- When the correct pressure has been obtained, close the service valve on the combination gauge set, and put compressor into operation.
- If pressure persists in building up above normal, repeat the above operation.
- Check with instructor.

Note: An overcharge of refrigerant will result in high head pressures, and for that reason it is sometimes necessary to purge a system for a considerable length of time. Always stop the purging operation at intervals of 15 minutes to 1/2 hour, and check the operating head pressure, as continuous purging might result in draining all the refrigerant out of the job. If after purging several times, you cannot get the correct readings, discharge the whole charge, draw a complete vacuum on the entire system, and recharge with the correct amount of refrigerant.

small leak will tend to flood the evaporator on the off cycle and may cause a slight frost back at the beginning of the on cycle.

It is not possible to pump the liquid out of the float chamber by closing the liquid line shut-off service valve as in the low side float, as the level becomes lower the float closes, whereas in the low side float the float opens with a lower level.

Some high side float systems are equipped with valves so that the entire receiver may be removed for replacing.

### Manhattan Catalog Shows Line of Rubber Products

PASSAIC, N. J.—A new 56-page general catalog covering the complete line of standard rubber products has been issued by the Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., of this city.

The catalog is printed in two colors and bound in a combination cover and file jacket. It describes various lines of belting, hose, fittings, packing, friction material, molded goods, matting and tread, rubber covered rolls and tanks, abrasive wheels, sundries and specialties, etc.

The pamphlet also contains list prices, information tables, and data.

### 11 Makes of Refrigerators Displayed by Erie Utility

ERIE, Pa.—Eleven makes of electric refrigerators are now on display in the windows of the Erie Light Co. here in a cooperative display which is scheduled to run throughout the summer.

Refrigerators on exhibition and names of dealers sponsoring the display are as follows:

Gibson—Young Bros.; Hotpoint—General Electric Supply Co., Erie Hardware Store, Northwest Electric Construction Co., Erie Radio Supply, Garvin Bros. Electric Co., G. H. Mc-Nerney, Long & Heugel; Stewart-Warner—Erie County Maytag Co.; Apex—Reliable Home Furnishing Co.; Frigidaire—Electric Specialty Co., Stanley Bros., Patterson-Stirling; Kelvinator—Winter Co., A. L. LeJeal; Westinghouse—Star Electric, F. M. Dawley, Boston Store, Crown Electric Store, R. J. Gensheimer Co., Electric Home Co.; Cold Spot—Sears, Roebuck. Norge—Epp Furniture Store, F. M. Dawley; General Electric—Arthur F. Schultz Co., Clougherty & Hilbert, Lynn Felheim Co., Trask, Prescott & Richardson; Spartan—Harley D. Carpenter, Kinem Radio Service.

The refrigerators are arranged in a V-shape and each has a placard with the name of the manufacturer, the sponsor, and associate dealers. To attract prospective consumers, the utility has offered an optional rate to all power consumers in Erie, Lawrence Park, and other suburbs and neighboring boroughs.

The optional rate calls for a fixed charge of 10 cents per 100 sq. ft. of floor space minus the 10 per cent allowance for walls, partitions, etc. Minimum charge under this optional plan is \$1.50, then three cents for the first 150 kwh. and two cents per kwh. over that, net rate.

### Salesman Buys Prospect's Colt So That He Can Make Down Payment

ASHEVILLE, N. C.—W. H. Newton, salesman for Asheville Gas Co., recently closed a sale through an old fashioned "horse trade."

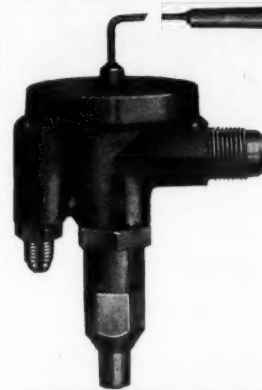
Mr. Newton had worked on his prospect for some time. He was unable to close the sale because the man had not sufficient cash to make the down payment of \$30 on an F-70 Electrolux.

After exhausting his persuasive powers, Mr. Newton remembered that the prospect had a shetland pony and a small colt. He immediately suggested that the man sell the colt to raise the required \$30.

This was not the end of salesman Newton's resourcefulness. He decided to buy the colt for his young nephew in Durham, N. C., and pay the down payment. The order was closed.

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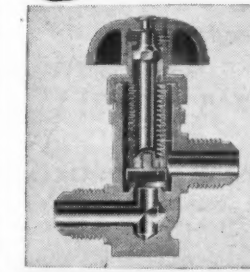
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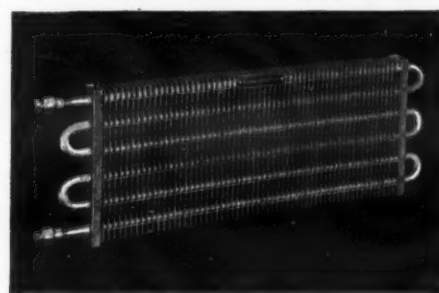
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### System Using Temperature Valve

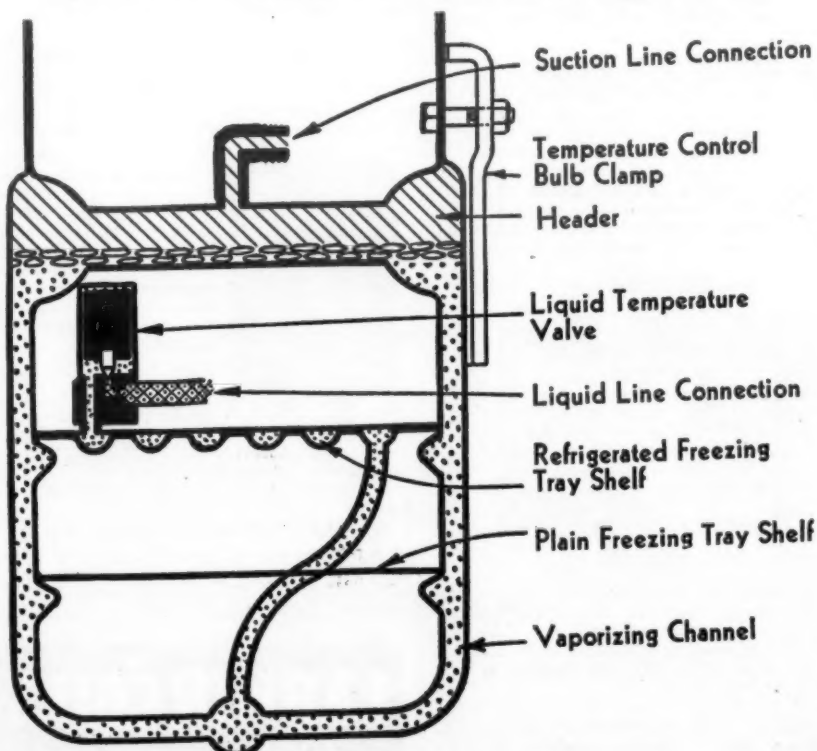
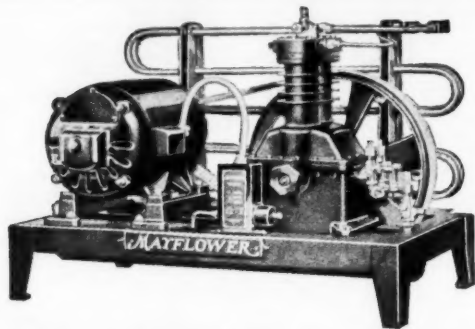


Fig. 96—Typical high side float valve in a Kelvinator shell type flooded system. The liquid temperature valve is shown in detail in Fig. 97.



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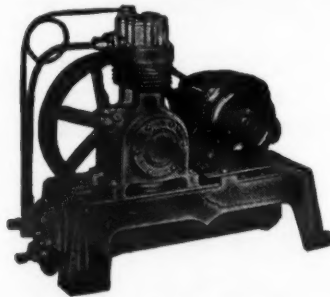
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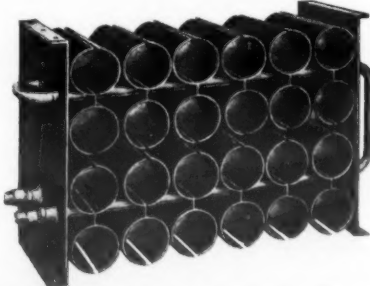
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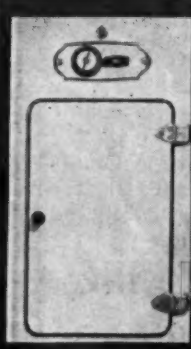
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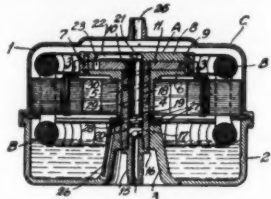


## PATENTS

Issued June 18, 1935

2,004,920. ROTARY COMPRESSOR. Edward H. Belden, Detroit, Mich. Application July 18, 1932. Serial No. 623,174. 3 Claims. (Cl. 230-140.)

1. The combination with a tight housing having an oil receptacle in its lower portion of an electric motor and a com-

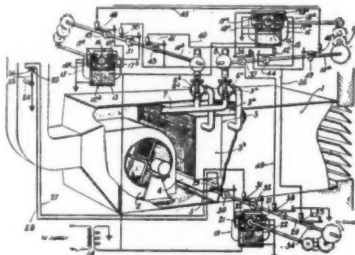


2,004,920

pressor in said housing, said housing having the middle of its bottom portion arranged to receive a vertically disposed stub spindle and a horizontal annular shoulder, a vertically disposed stub spindle fixed in said bottom portion with a helical groove on its outer surface and having its topmost portion arranged to form an eccentric spindle, said motor having an armature sleeve journaled on said spindle with its lower end supported by said shoulder, said compressor comprising a casing concentric with said armature and with its bottom directly connected with said armature sleeve, a circular impeller in said casing mounted on said eccentric spindle, and a vertically slidable spring-pressed sleeve mounted in the main spindle and bearing against the top of said casing, said housing having a passageway extending from the lower portion of the oil receptacle and communicating with the outer surface of said spindle.

2,004,940. CONTROL FOR AIR CONDITIONING SYSTEMS. Theodore K. Greenlee, Rockford, Ill., assignor to Howard D. Colman. Application Oct. 23, 1931. Serial No. 570,613. Renewed Aug. 16, 1934. 22 Claims. (Cl. 236-38.)

1. A system for controlling the temperature of an air current passing through a circulating duct comprising, in combina-



2,004,940

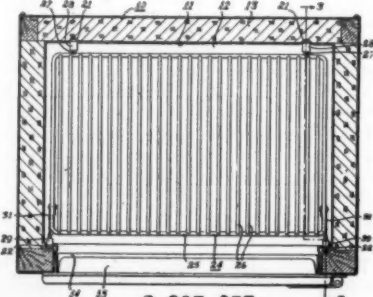
tion, a heater in said duct, a by-pass around said heater, a damper controlling said by-pass to determine the proportion of the air current subjected to said heater, a power operator for said damper having electric motor driving means with two windings selectively energizable to determine the direction and extent of movement of said damper between open and closed positions, a thermostat responsive to the temperature of the heated air and having switches controlling circuits through said windings, a valve controlling the amount of heat delivered to said heater, a power operator for said valve having electric motor driving means with two windings selectively energizable to determine the direction and extent of movement of said valve, and two switches actuated by said damper operator and controlling circuits for said last mentioned windings, one switch being closed when said damper reaches closed position and the other switch being closed when the damper reaches open position.

2,005,013. EVAPORATOR FOR REFRIGERATION MACHINES. Alfred Teves, Frankfurt-on-the-Main, Germany. Application Jan. 29, 1932. Serial No. 589,737. In Germany Feb. 26, 1931. 6 Claims. (Cl. 62-126.)

1. An evaporator for refrigerators comprising a reservoir for liquid refrigerant, a plurality of refrigerating tubes connected thereto each having a portion below both ends arranged above the normal level of liquid refrigerant, whereby they are normally empty of liquid refrigerant, and at least one refrigerating tube connected to said reservoir with its inlet end below the normal liquid level.

2,005,057. REFRIGERATING APPARATUS. Otto M. Summers, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Application Jan. 19, 1934. Serial No. 707,299. 5 Claims. (Cl. 211-153.)

1. A shelf for a refrigerator cabinet comprising, opposed supporting portions on said shelf adapted to fit against



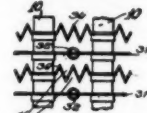
2,005,057

opposed walls of a compartment in the cabinet, certain of said supporting portions being pivotally secured to said shelf and forming a toggle device, said toggle device being so constructed and arranged that when in substantially horizontal

alignment with the shelf the opposed shelf supporting portions are adapted to tightly engage the opposed walls of the compartment to firmly hold the shelf in position therein and when moved out of said substantially horizontal alignment with the shelf certain of said shelf supporting portions will be released from the compartment walls to permit free movement of the shelf relative to the walls, and certain of said shelf supporting portions being adjustable horizontally relative to said shelf.

2,005,235. RADIATOR STRUCTURE. Arthur B. Modine, Racine, Wis., assignor to Modine Mfg. Co., Racine, Wis., a corporation of Wisconsin. Application July 22, 1931. Serial No. 552,362. 1 Claim. (Cl. 257-130.)

A radiator core comprising a plurality of tubes and transverse fins mounted upon said tubes, certain of said fins hav-



2,005,235

ing transverse corrugations formed therein between the tubes, in combination with fins having flat non-corrugated surfaces on opposite sides thereof arranged intermediate said corrugated fins, said flat fins having apertures therein, and means at said apertures adapted to engage and direct a part of the air passing through the radiator through said apertures and toward an adjacent fin.

2,005,277. EVAPORATOR. Jens Touborg and Homer E. Rosebrook, Greenville, Mich., assignors to Gibson Electric Refrigerator Corp., Greenville, Mich., a corporation of Michigan. Application Oct. 15, 1934. Serial No. 748,386. 9 Claims. (Cl. 62-126.)

1. An evaporator in the form of a single substantially flat substantially hori-

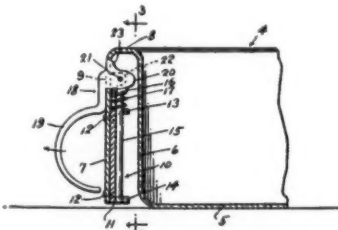


2,005,277

zontal shelf with means for supporting the same in a refrigerator, said means permitting raising or lowering of one edge of said shelf.

2,005,292. ICE CUBE TRAY. Albert S. Haislip, Fredericksburg, Va. Application July 27, 1933. Serial No. 682,498. 7 Claims. (Cl. 62-108.5.)

1. An ice cube tray, a bracket having guide members on the front wall of said tray, a thrust pin mounted for vertical



2,005,292

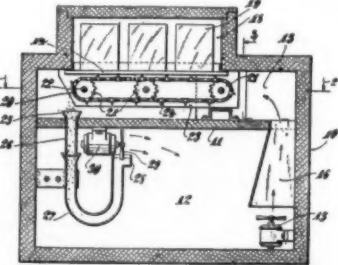
sliding movement in said guide members, spring return means for said pin surrounding the pin, said return means serving to retain the lower end of the pin retracted to a substantially flush position with respect to the bottom tray, and manually actuated means carried by said tray and cooperable with the upper end of the pin for actuating said pin, said means being in the form of a pivoted lever and having a cam element engageable with said pin.

2,005,354. REFRIGERATING METHOD AND APPARATUS. Andrew L. Still, Los Angeles, Calif. Application May 7, 1934. Serial No. 724,405. 8 Claims. (Cl. 62-115.)

1. The refrigerating apparatus which includes a condenser coil which surrounds a compressor, a fan and a motor which drives the said compressor and fan, the compressor and the air fan and the motor secured to the condenser coil so that the said coil supports the said members, an expansion valve, a pipe communicating with the expansion valve and the condenser, a freeze member communicating with the expansion valve and a pipe communicating with the freeze member and the compressor.

2,005,558. APPARATUS FOR HYDRATING AIR IN REFRIGERATING MECHANISMS. Edwin M. Post, Jr., New York, N. Y., assignor to International Motor Co., New York, N. Y., a corporation of Delaware. Application Nov. 15, 1932. Serial No. 642,724. 4 Claims. (Cl. 62-140.)

1. A refrigerating device comprising a refrigerating chamber, a refrigerating element associated therewith, a scraping



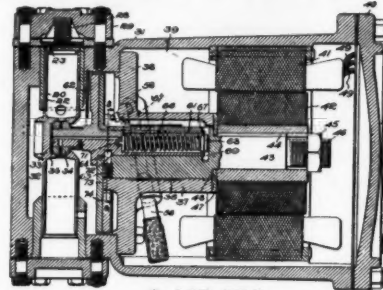
2,005,558

mechanism to remove frost from the refrigerating element, means associated with the chamber to melt the frosting, and air circulating means in the chamber to vaporize the resulting liquid in the refrigerating air.

2,005,578. COMPRESSING MACHINE. William D. Drysdale, Buffalo, N. Y., assignor to Walter J. Sugden, Boston, Mass. Application Aug. 6, 1932. Serial No. 627,736. 19 Claims. (Cl. 230-20.)

1. In a refrigerant pump, the combina-

tion of a cylinder having a lateral intake port, an outlet valve, a piston working in said cylinder and adapted to cover and uncover said port, and mechanism to



2,005,578

impart to said piston a reciprocating motion of variable amplitude varying from a zone within which said piston covers and uncovers said port and causes refrigerant to be admitted through said port and discharged past said outlet valve, to a zone within which said piston maintains said port closed.

2,005,611. DRY ICE REFRIGERATING SYSTEM. William W. Carson, Jr., Knoxville, Tenn., assignor to The Fulton Syphon Co., Knoxville, Tenn., a corporation of Delaware. Application June 6, 1933. Serial No. 674,573. 12 Claims. (Cl. 62-91.5.)

1. The method of refrigerating a chamber which includes the steps of condensing a vaporizable liquid in heat interchanging relation with solid carbon dioxide or the like, flowing the condensed liquid by gravity to an evaporator in said chamber, absorbing heat from said chamber at a series of vertically distributed levels in said chamber by evaporating some of said liquid at each of said levels while raising unevaporated liquid to the next higher level by the vapor formed at each level until the main portion of said liquid reaches a main evaporator disposed adjacent the upper portion of the chamber to be refrigerated, evaporating the liquid in said upper evaporator to maintain the desired temperature within said chamber, and returning the vapor evolved from said main evaporator to said coil for recondensation.

### REISSUE

19,615. LIQUID COOLING APPARATUS. Leo Samel, Irvington, N. J. Original No. 1,985,263, dated Dec. 25, 1934. Serial No. 696,582, Nov. 3, 1933. Application for reissue April 4, 1935. Serial No. 14,638. 13 Claims. (Cl. 225-40.)

1. A liquid cooling apparatus comprising a main container, a plurality of auxiliary containers, means providing communication between the bottom of the main container and the top portion of the respective auxiliary containers, means for directing liquid into the main container, a pipe for directing liquid from the bottom of the auxiliary containers, a housing surrounding and spaced from said pipe, said housing acting in the double capacity of protecting means and insulating means, and a vent valve provided at the highest point in each of said containers.

19,618. DESIGN FOR A REFRIGERATOR CABINET. Clarence Wexelberg, Detroit, Mich., assignor, by mesne assign-



19,618



ments, to General Household Utilities Co., Chicago, Ill., a corporation of Delaware. Original No. 93,314, dated Sept. 11, 1934. Serial No. 46,312, Dec. 5, 1932, for 14 years. Application for reissue Feb. 15, 1935. Serial No. 55,455. Term of patent 14 years. The ornamental design for a refrigerator cabinet substantially as shown.

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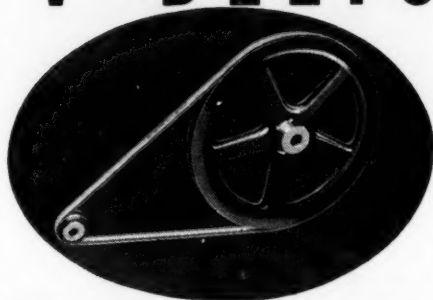


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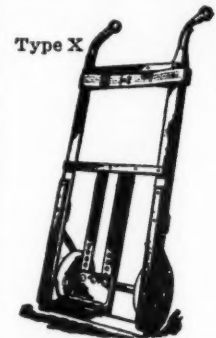
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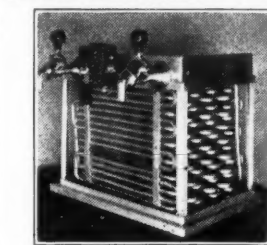


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	Electric Refrigeration News (weekly)	1935 Refrigeration Directory and Market Data Book (2 volumes)	Both Electric Refrigeration News and Refrigeration Directory
1 subscription	\$3.00	\$5.00	\$6.50
5 or more each	2.75	4.50	6.50
10 or more each	2.50	4.00	6.50
20 or more each	2.25	3.50	5.75
50 or more each	2.00	3.00	5.00
75 or more each	1.75	2.50	4.25
100 or more each	1.50	2.00	3.50

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7-3-35

## QUESTIONS

### Specifications

No. 2323 (Dealer, Washington)—“Please advise us if the REFRIGERATION AND AIR CONDITIONING DIRECTORY gives the specifications of the merchandise therein listed.”

Answer: Specifications are not included in the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY. Specifications of household electric refrigerators were published in the June 12 issue of the ELECTRIC REFRIGERATION NEWS, specifications of air conditioners in the May 22 issue, and commercial machine specifications will be found in the April 3 issue.

### Refrigeration Valves

No. 2324 (Dealer, Quebec, Canada) “Could you let us have the name of a firm manufacturing all kinds of valves for electric refrigeration, for tubing 1/4 in., 1 in., and up?”

Following are some manufacturers of valves for use with electric refrigeration systems:

#### Check Valves

Fedders Mfg. Co.  
57 Tonawanda St., Buffalo, N. Y.  
Kerotest Mfg. Co.  
2525 Liberty Ave., Pittsburgh, Pa.  
Weatherhead Co.  
632 Frankfort Ave., Cleveland, Ohio.

#### Expansion Valves, Automatic

Alco Valve Co., Inc.  
2628 Big Bend Blvd., St. Louis, Mo.  
American Injector Co.  
1481 14th St., Detroit, Mich.  
Automatic Products Co.  
121 North Broadway, Milwaukee, Wis.  
Detroit Lubricator Co.  
5842 Trumbull Ave., Detroit, Mich.

Electromatic Corp.  
2100 Indiana Ave., Chicago, Ill.  
Fedders Mfg. Co.  
57 Tonawanda St., Buffalo, N. Y.  
Lidseen, Inc., Gustave  
832 S. Central Ave., Chicago, Ill.  
Peerless Ice Machine Co.  
515 W. 35th St., Chicago, Ill.  
Refrigerating Specialties Co.  
728 S. Sacramento Blvd., Chicago, Ill.  
Riley Engineering Corp.  
1481 14th St., Detroit, Mich.

#### Expansion Valves, Thermostatic

Alco Valve Co., Inc.  
2628 Big Bend Blvd., St. Louis, Mo.  
American Injector Co.  
1481 14th St., Detroit, Mich.  
Detroit Lubricator Co.  
5842 Trumbull Ave., Detroit, Mich.  
Fedders Mfg. Co.  
57 Tonawanda St., Buffalo, N. Y.  
Peerless Ice Machine Co.  
515 W. 35th St., Chicago, Ill.  
Riley Engineering Corp.  
1481 14th St., Detroit, Mich.

#### Manifold Valves

Imperial Brass Mfg. Co.  
564 S. Racine Ave., Chicago, Ill.  
Kerotest Mfg. Co.  
2525 Liberty Ave., Pittsburgh, Pa.  
Weatherhead Co.  
632 Frankfort Ave., Cleveland, Ohio.

#### Needle Valves

Commonwealth Brass Corp.  
5781 Commonwealth Ave., Detroit, Mich.  
Central Brass Mfg. Co.  
2590 E. 55th St., Cleveland, Ohio.  
Curtis Refrigerating Machine Co.  
1936 Kienlen Ave., St. Louis, Mo.  
Imperial Brass Mfg. Co.  
564 S. Racine Ave., Chicago, Ill.  
Kerotest Mfg. Co.  
2525 Liberty Ave., Pittsburgh, Pa.  
Weatherhead Co.  
632 Frankfort Ave., Cleveland, Ohio.

#### Pressure Reducing and Regulating Valves

American Injector Co.  
1481 14th St., Detroit, Mich.  
Curtis Refrigerating Machine Co.  
1936 Kienlen Ave., St. Louis, Mo.  
Fedders Mfg. Co.  
57 Tonawanda St., Buffalo, N. Y.  
Riley Engineering Corp.  
1481 14th St., Detroit, Mich.  
Temprite Products Corp.  
1349 Milwaukee Ave., East, Detroit, Mich.

#### Pressure Valves

Automatic Products Co.  
121 N. Broadway, Milwaukee, Wis.  
Central Brass Mfg. Co.  
2590 E. 55th St., Cleveland, Ohio.  
Fedders Mfg. Co.  
57 Tonawanda St., Buffalo, N. Y.  
Kerotest Mfg. Co.  
2525 Liberty Ave., Pittsburgh, Pa.

#### Mueller Brass Co.

1925 Lapeer Ave., Port Huron, Mich.  
Refrigerating Specialties Co.  
728 S. Sacramento Blvd., Chicago, Ill.  
Riley Engineering Corp.  
1481 14th St., Detroit, Mich.  
Weatherhead Co.  
632 Frankfort Ave., Cleveland, Ohio.

#### Relief Valves

American Injector Co.  
1481 14th St., Detroit, Mich.  
Riley Engineering Corp.  
1481 14th St., Detroit, Mich.

#### Shutoff Valves

Alco Valve Co.  
2628 Big Bend Blvd., St. Louis, Mo.  
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5842 Trumbull Ave., Detroit, Mich.  
Electromatic Corp.  
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Fedders Mfg. Co.  
57 Tonawanda St., Buffalo, N. Y.  
Kerotest Mfg. Co.  
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## Belding-Hall Co.

No. 2325 (Dealer, Massachusetts)—“Kindly let me know if the firm Belding Hall Co. are still doing business and where they are located.”

Answer: Write Gibson Electric Refrigerator Corp., Greenville, Mich. According to our records the Belding Hall Co. was absorbed by the Gibson Corp. several years ago; and a year ago was still doing business under the Belding Hall corporate name.

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No. 2326 (Manufacturer, Missouri)—“Please let us know the price of the 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK.”

Answer: The 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK is \$3 per copy postpaid in the United States.

## Compressor Oils

No. 2327 (Dealer, Arizona)—“Will you please give me the following information either through your news columns or by personal letter:

“(1) Will SO<sub>2</sub> compressor oil work with methyl chloride?

“(2) Will methyl chloride compressor oil work with SO<sub>2</sub> gas?

“(3) What grade of compressor oil should be used on low temperatures, such as ice cream cabinets?”

Answer: Suppliers of compressor lubricating oils are:  
Matheson Co., East Rutherford, N. J.  
Sinclair Refining Co.  
45 Nassau St., New York, N. Y.  
Sonneborn Sons, Inc., L.  
88 Lexington Ave., New York, N. Y.  
Standard Oil Co. (Indiana)  
910 S. Michigan Ave., Chicago, Ill.  
Standard Oil Co. of California  
225 Bush St., San Francisco, Calif.  
Sun Oil Co., 1608 Walnut St., Philadelphia  
Texas Co., 135 E. 42nd St., New York, N. Y.  
Vacuum Oil Co.  
61 Broadway, New York, N. Y.

We suggest that you write to one or more of these companies which have developed special oils for refrigeration uses and have done considerable research work along these lines.

## Motors & Cabinets

No. 2328 (Manufacturer, Illinois)—“We are desirous of securing a list of manufacturers who make refrigerator motors or cabinets, or both, this list to include manufacturers of refrigerator display cases as well as those who make commercial and household refrigeration.”

Answer: The 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY contains lists of manufacturers of all types of refrigeration and air-conditioning equipment including companies making motors, cabinets, display cases and manufacturers of complete household and commercial systems.

## Individual Sales

No. 2329 (Sales and Service Company, Pennsylvania)—“Kindly advise the writer if it is possible to obtain the standing of the three major refrigeration manufacturers, namely, Kelvinator, Frigidaire, and General Electric, in their sales to June 1st.”

Answer: Individual sales figures are not made available to us. Sales of 14 manufacturers of household refrigerators are reported to the Household Refrigeration Division of the National Electrical Manufacturers Association and only totals for this group are given to us for publication.

## Majestic Units

No. 2330 (Dealer, Massachusetts)—“Could you furnish us with information where we could get a unit for a Majestic refrigerator? We would appreciate an early reply.”

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